Forestry

NOV 19 1935

VETERINARY MEDICINE

DECEMBER 1935

CONTENTS

Official Bulletins of the Hour 518
William Henry Welch 519
Our Two-Way System of Animal Conservation 520
Experiment Station Bulletins Tell Him Just How 522
Handled 1000 Animals a Day 523
Examination of Urine 524
Tetrachlorethylene in the Treatment of Hookworms 525
Sarcoptic Scabies in the Dog 526
American Public Health Association 528
Unusual Tapeworm Cysts in a Rabbit 529
Paralysis from Spinal Pressure 529
State Board Examination Questions 530
Liability for Water Pollution 532
Legal Principles of Milk Control 535
Treatment of Retained Corpus Luteum in the Cow 536
Do You Remember? 538
Animal Food and Nutritive Requirements 539
Outstanding Diseases and Peculiarities of Cats 543
Distemper Vaccination 547
Amebic Dysentery in Dogs 549
Veterinary Service and Rural Public Health 551
Canine Distemper Prophylaxis and Treatment 553
Laying Mashes Not Suitable for Dog Food 556
Drugs Used in Veterinary Medicine 559
Hyperplasia of the Uterine Wall in Dogs 562
Ether Treatment for Shipping Fever in Horses 562
Porcine Dystocia 563
Diagnosis of Hog Cholera 563
Diseases of Colts 563
Source of Tuberculosis in Calves 564
Diagnosis of Infectious Anemia 564
Relief of Intestinal Obstruction 564
Air Bubbles in Blood Vessels 565
Technique for Removal of the Kidney in the Cow 565
Effect of Amniotic Fluid on Br. Abortus 566
Influence of Magnesium on Rickets 566
Complement Fixation Test for Tuberculosis 566
Index 567

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75 E. Wacker Drive
Chicago, U. S. A.

Junior FORT DODGE BIO-CHEMIC REVIEW

DECEMBER 1935

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It stands for the dog food which is rapidly gaining in demand because its nutritive value is *proving* its superiority to veterinarians everywhere.

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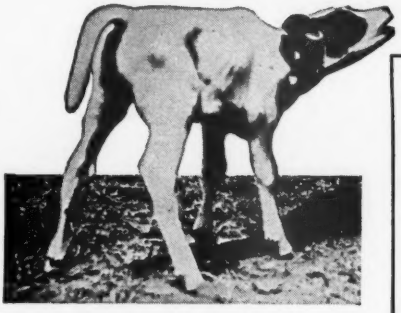

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Anti-White Scour Serum (Bovine) Mulford is a highly potent serum prepared from the blood of cattle immunized to the colon and paracolon groups of bacteria isolated from cases of white scours in calves. A dose of 30 cc., injected shortly after birth, effectively prevents the development of the disease. It is valuable also for curative treatment. Supplied in 30-cc. vials and 100-cc. bottles.

White Scour Serobacterin Mixed (Bovine) Mulford is a sensitized bacterin which yields more prompt immunizing effect than may be obtained from plain bacterin. It has wide polyvalency, including all the bacteria commonly found in cases of white scours. It may be used both as a prophylactic and as a curative. Supplied in packages of six 5-cc. vials and in vials of 50 cc.

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What IS *the Dosage?*

When placing orders for Capsules of Carbon Disulphide, the thinking veterinarian should protect himself and his client by demanding a truthful answer to two questions:

1. "What IS the proper dosage of Carbon Disulphide for adult equines?"

2. "Does your capsule contain 6 drams by *volume* or by *weight*?"

The answer to the first question can be found in these facts:

In 1926 (*Farmer's Bulletin No. 1503*) the U.S.B.A.I. said, "The dose for a horse weighing about 1000 pounds is 1 dose of 6 drams, or 2 doses of four drams each."

Six years later (*Vet. Med.*, Jan. '32) Wright of the Bureau in a review of bot-control work concluded "that the dose should be 6 drams for a 1000 pound animal, that it should be given in capsule or by stomach tube," etc. He further quoted Hall as finding that one six dram dose is as effective as *two* doses of four drams.

As for the answer to the second:

The specific gravity of carbon disulphide is such that a capsule of carbon disulphide containing 6 drams by *weight* contains only 4.7 drams by *volume.*

In the capsule filled with liquid carbon disulphide the drug is measured by *volume.*

This year Pitman-Moore Company again offers the profession the same type of bot capsules filled with 6 fluidrams of carbon disulphide as were so successfully used by a large majority of practitioners last winter.

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Veterinary Medicine

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor
H. J. Mostyn, R.K.O. Bldg., New York, Eastern Representative

Scurvy, a disease rare in the United States until the past three years, is now seen in appreciable numbers by pedriatrists. The depression and consequent malnutrition is blamed.

* * * *

An association was organized in 1885, known as "The State, Territorial and Government Veterinarians of Live Stock Sanitary Commissions and Boards of Health, Live Stock Agents of Railroads, and Editors of Live Stock Journals." R. S. Huidekoper, Dean of the Veterinary Department, University of Pennsylvania, was elected president; J. Gerth, Jr., State Veterinarian of Nebraska, secretary, and Geo. C. Faville, State Veterinarian of Colorado, assistant secretary.

* * * *

Quarantining families for scarlet fever is a questionable practise, leaving too many persons as carriers of the disease after release from quarantine, according to Dr. John P. Koehler, Milwaukee health commissioner. Speaking from the experience of the 1934-1935 epidemic in Milwaukee he said that quarantining prevents some exposures and delays some infections, but is almost worthless in an epidemic. "Isolation of cases by hospitalization does more to prevent additional cases in the homes," he said. "Immunization helped largely to control the epidemic."

Wonder what the commissioner would say of the ordinary rabies quarantine?

The principal thing that distinguishes the progressive from the decadent countries, is mental freedom; and in science this quality is indispensable.—*Sec. Wallace.*

* * * *

Two new cancer-causing chemicals, triphenylbenzene and tetraphenylmethane, have been discovered by Morton and Clapp of the Massachusetts Institute of Technology and Branch of Evans Memorial Hospital, Boston. These new carcinogenic agents differ markedly in chemical structure from previously known chemicals capable of causing carcinoma.

* * * *

An apparatus for measuring the vitamin A content of cod liver and other fish oils has been patented in Great Britain and a patent applied for in the United States, France and Germany. It is said to enable any reasonably intelligent operator to determine rapidly, without the use of reagents and without color discrimination, the vitamin A content of fish liver oil. The apparatus is known as the Hilger Vitameter A.

* * * *

Science, to be fruitful, must be free. To make its fruits socially available, science must be organized. Science cannot be blueprinted and pushed forward on schedule. Often scientists should be under no obligation to produce immediate results. Sometimes on the other hand, they must answer emergency calls. The great thing, in directing science, is not to regiment it; for that would kill it.—*Sec. Wallace.*

Official Bulletins of the Hour

AMONG the legion of technical bulletins on veterinary medicine published at public expense, with the object of making animal doctors at wholesale, there are many contradictions which must seem strange to the near doctors taking their course of instruction from them. One says kamala is a bull dog, another says it is only a rabbit; one takes Fowler's solution for a "ride," after another had given this kalium-arsenicum hook-up quite a send off in the feed lot; and still another, fouls rabies vaccination in the kick for a goal.

Carloads of kamala, that were probably not kamala at all, have been used by farmers; and whoever said that farmers should use arsenic *ad libitum* for any purpose? Is there no reason anywhere in this fling at home doctoring of animals? Is the pharmacopœia just a joke book? In regard to rabies vaccination, who has ever claimed that a man or a dog or a guinea pig injected with a massive dose of rabies virus sub-durally might not die in spite of vaccination or advised vaccination for other than natural infection? It is pretty safe but not very heroic to pommel a straw man. In the maze of confusion, the veterinarian in private practice wonders whether he should pray or laugh. But the matter is not humorous.

VETERINARY MEDICINE believes that the veterinary service of this country is passing through a period of transition that may easily, but disastrously, lead from science to quackery. We also support the belief that the bankrupt condition of the farming industry is pretty closely related to the tremendous, unnecessary losses from animal diseases, losses both direct and indirect. We are not unaware that we are playing with pretty hot fire in attempting to expose the plain truth. It is simply a case of "duty, honor, country," as we see it in our perspective. Are funds appropriated for a loose system of medicine justified?

The outraging of veterinary practice, the attrition of the Federal meat inspection system by bootlegging butchers, the replacement of veterinarians in official positions, and the increasing distribution of drugs, chemicals and vaccines to farmers under official sanction, are just a few among other trends supporting the contention that the veterinary service of our vast livestock industry is being led blindly in the wrong direction, under unwise leadership, or perhaps, no leadership.

CERTAINLY, the broadcasting of technical bulletins, some good and some not so good, with the object of teaching a smattering of veterinary medicine to students of the agricultural colleges, which it was once thought would develop a sufficient veterinary service, is unbecoming of the broadminded American of 1935. It is indeed doubtful if any of these bulletins has saved animal property sufficient to defray the cost of producing it, not to mention its indirect cost in inhibiting the development of the kind of veterinary service economy and science insist upon at this period of world's history. One such discussion just out, is a highly technical treatment of a certain disease of sheep, printed for the first time in a sheep magazine whose readers must indeed be master minds in the science of experimental medicine if any good is to come from the effort. Another, published a year ago, tells all about detecting mastitis with colorimetric tests and physical examinations, without previous study of the anatomical structure, or physiology of the udder, or cultivation of the discriminating sense of touch required. Another explains how to extirpate obstruction of the teats by instrumentation, an operation the most skillful veterinarian approaches with considerable anxiety. These represent the kind of veterinary service being planned to replace the clinical work, graduates of the veterinary colleges are trained to perform. There are many things farmers can be taught to improve their husbandry of animals, not the least of which is the importance of a better veterinary service than they are now getting.

W. H. Welch, Lexington, Illinois (left); S. Brenton, Detroit (center); and A. J. Savage, Colorado Springs (right).

IN this connection, a quotation from the "Veterinary Military History of the United States" is *apropos*:

"The production of domestic animals is one of the foundations of American industry. Boundless acres of productive land, adequate rainfall and favorable climatic conditions made possible the development of our livestock industry. Yet, unpleasant as it may be to point out the truth, animal production in the United States has been only superficially successful, and from some points of view, has been a colossal failure. It has grown vast in the midst of great natural resources but, at the same time, the producers have become impoverished from lack of voluntary discipline and the absence of unified direction. The veterinary profession is obliged to call attention to this unfortunate fact. That profession maintains close contact with the livestock industry and its vision is trained to appraise the situation and to see the pitfalls. To both practical and scientific minds, the status of animal production in the United States is that of a disorganized affair from which no enduring prosperity can be expected, unless some essential changes are made. No nation, less fortunately endowed by nature, could have survived the staggering losses from diseases of animals that the American people, unaware and misinformed, have written into their balance sheet year after year.

"At this time disease is the limiting factor in our animal production. Our poultrymen can breed 300-egg hens, but 30 per cent of them die before completing the first egg-laying year, wiping out prospective profits; our dairymen can build herds of ten-thousand pound cows, but the toll of mastitis forestalls a profit; there is no difficulty in farrowing a litter of pigs capable of weighing a ton in six months, but the most skillful breeder cannot make them pay for their feed after enteritis takes its cut."

WILLIAM HENRY WELCH

After an illness that confined him to his bed for several months and a much longer period of ill health, Dr. W. H. Welch, former Chief Veterinarian of the Illinois Department of Agriculture and a former president of the American Veterinary Medical Association, died at his home in Lexington, Illinois, October 24, 1935.

Except for a period of a little less than four years, during which Doctor Welch was at Springfield with the State Department of Agriculture, he had practiced continuously in Lexington since his graduation from the Chicago Veterinary College 43 years ago. He had been a leading practitioner in the state throughout this period and active in all matters affecting the profession, particularly in organized veterinary medicine, having served the state association as secretary, 10 years, and as president.

Fifty-eight veterinarians, many of them accompanied by their wives, attended his funeral—an evidence of the high regard in which he was held by the veterinary profession of his state. A unique feature of the funeral service was a eulogy of the deceased by Dr. L. A. Merillat of Chicago, an intimate associate of his throughout his professional career. Both Doctor Merillat and the minister who conducted the formal service, stressed the friendliness of Doctor Welch—his most outstanding characteristic and one that bound both confreres and clients to him with the strongest bonds.

In selecting for use in this account a photograph of the deceased, none showing him alone seemed to quite serve the purpose. Those who knew him just cannot quite visualize him in isolation. The situation does not fit. Herewith he is shown with two of his old-time friends in an intimate *tete-a-tete* at the Des Moines meeting of the A. V. M. A. in 1924. Of the three, Doctor Welch was the last to pass on, Doctor Brenton having preceded him in 1925 and Doctor Savage by a month.

Doctor Welch was in his sixty-fifth year at the time of his death, which was due to heart disease. He is survived by his widow and two daughters.

Our Two-Way System of Animal Conservation

THE two-way system of handling diseases of animals, the one bent upon teaching everyone to "roll his own" and the other determined to develop a profession of college-trained veterinarians, is not likely to fulfill its obligations to the American farmer. One or the other of these two systems must capitulate. Either the agricultural group who believe that veterinary medicine is a trifling science and its application a simple art, or the college-trained group who believe successful handling of animal diseases is important and should be grounded upon the world's knowledge of pathology and its skillful execution must yield, before the tremendous losses piling up year after year can be diminished to reasonable figures. The two, working at cross purposes in the same field, can scarcely succeed. And, when the one or the other has thus yielded, the altruism characterizing the behavior of professional medicine must replace the ruling egoism of the present time, or a disease industry must be established, conducted on modern business lines. It may be said in passing that business conserves and develops its field, its market, its job. It is proper that it should, but that all activities, e. g., disease, should be handled in that manner may be questioned.

THE results of making disease an industry are observable all about us. Two examples will suffice:

(1) In tick eradication in Texas, among the non-professional personnel in the field, there is no desire to complete the job, but on the contrary, a determination to conserve that source of livelihood. Former State Veterinarian Williams has said that this element with its political backing was the most formidable obstacle with which he and the Federal veterinarians had to contend, in tick eradication. According to one Federal official in charge of the work, political influences were responsible for the waste of 95 cents out of every dollar spent on the project.

(2) When outbreaks of hog cholera result, as they frequently do, from the distribution of virus by county agents, in Illinois the tendency is almost universal to attempt to cover it up. The disease is called anything but hog cholera, because to admit the truth would hurt future sales and profits. Among county agents the one who has sold the most serum and virus is the greatest hero—an example to the others, although under present Illinois conditions, serum and virus sales mean hog cholera outbreaks—just that. If more is sold in a given county this year than last, it means more hog cholera this year than last. Yet the salesman receives the accolade. In the disease business, he has been successful. For a professional set up, the same result would be a failure.

AT the risk of redundancy, a third example may be cited: the quack poultry doctors launched by Doctor Salsbury's Poultry Disease School at Charles City, Iowa, upon an industry, progress in which is already blocked by disease more than by any other factor. These young men from farms and hatcheries, feed stores and like sources are "graduated" after a two weeks' course in what is essentially salesmanship. That is, the symptoms and lesions of poultry ailments are shown and explained in a way to enable the student to determine the vaccine or other agent to supply the owners of flocks in which he later finds conditions that appear to be similar. Approximately 400 have already completed the course in the 23 classes that have been conducted and are organized into an "alumni" association to further their own and the school's interests. Upon graduation each becomes an agent for Doctor Salsbury's poultry remedies. His function is to diagnose ailments and prescribe the remedy. He is forbidden by law to charge for this service and can be remunerated only by his commission on sales—principally on the sale of bacterins and vaccines. His livelihood and his future service to the

community depend upon it. How's that for a service set-up? How often will Salsbury's agent find that better housing, improved sanitation or a change in feed is *all* that is required? And in the last analysis, how does the quack poultry doctor set-up differ from that of the quack hog doctors turned out by the agricultural colleges, except that the latter have official backing?

WITHOUT the altruism of Hippocrates, medicine may be a deadly racket.

Robert Louis Stevenson must have had something of this difference between a business and a profession in mind when he penned this famous tribute to the physician:

> There are men and classes of men that stand above the common herd: the soldier, the sailor and the shepherd not infrequently; the artist rarely; rarelier still, the clergyman; the physician almost as a rule. He is the flower (such as it is) of our civilization; and when that stage of man is done with, and only to be marveled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably exhibited the virtues of the race. Generosity he has, such as is possible to those who practice an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important; Herculean cheerfulness and courage.

HALT MEASLES WITH HEATHEN CUSTOM OF OLD

An old heathen custom, revived with scientific improvements at Boston, was credited by speakers before the American Public Health association, with preventing measles in a surprisingly large number of cases.

Some aborigines, after a child was born, saved and dried the placenta. In after years whenever the child ailed, it was fed him as "good medicine."

At Boston a purified placental extract is given by the spoonful for measles.

Drs. Elliott S. Robinson, of the Massachusetts department of public health, and Charles F. McKhann, of Harvard medical school, reported the use of this extract both by intramuscular injection and by mouth.

The hypodermic method stopped 60 per cent of cases during incipiency, and removing danger of death frequently even in later stages.

"We have also tried," said Dr. Robinson, "giving this extract by mouth. The results show that the old heathen custom was not so ridiculous as might be supposed.

"We gave the extract by mouth to 33 children in the incubation stage of measles. In two-thirds of them the measles was either prevented or modified."

WHAT IS THE VETERINARY SERVICE OF A COUNTRY?

WHEN one speaks of the veterinary service of the United States, one does not mean merely the state regulatory forces engaged in the handling of a few diseases at public expense. The veterinary service of a country comprises everything that is done for sickness among animals from the most quackish nostrum sold to owners of animals by crafty peddlers or by catchy advertisements to the most brilliant researches conducted in private or public laboratories. A state regulatory force may be excellent *per se* and yet be working amid the most quackish program conceivable. It is strangely necessary that such a definition must still be made.

There are two, and only two, classes of veterinary service, the one bent upon handling animal diseases by teaching owners how and the other depending upon skilled practitioners trained in veterinary colleges carrying out an approved curriculum. "To which one do you belong?" is a reasonable question.

PUBLICITY

The American Medical Association was first among the health organizations to make use of the radio. It began broadcasts in 1923 and has maintained them as a continuous policy ever since, both from its headquarters in Chicago and from all annual meetings during the last five years.

In addition, more than 150 of its state and county constituent societies have been broadcasting regularly over local radio outlets. It is estimated that more than 7,000 radio talks are broadcast annually in the United States by state and county medical societies and the American Medical Association. During the fall and winter, the programs include dramatization technique and music.

* * * *

An appendicitis operation—or any other major operation—with all the necessary hospitalization thrown in, can be had in Sweden for 50 cents a day, according to Dr. Einor Rietz, health commissioner of Stockholm. "Sweden believes that health is a part of the responsibility of the community. So we make it possible for all patients to get the best of care, and besides we provide the doctor with an adequate income," Doctor Rietz stated at the annual meeting of the American Public Health Association, Oct. 8, 1935.

* * * *

FARMERS BUYING MORE IMPORTED ANIMALS

An upswing in the importation of purebred animals for breeding purposes—greatest since 1930—is shown with the entry of 10,836 animals into the United States during the fiscal year ended June 30, 1935. A total of 7,411 purebred animals were imported in 1934; in 1933 the arrivals totaled 6,939; in 1932 the number imported was 10,647; in 1931 a total of 7-818 were brought in, and in 1930 the importations amounted to 12,843.

Of the total animals imported during the last fiscal year, 8,663 were cattle, 1,036 sheep, and 274 horses. The cattle were mostly of the dairy breeds but the horses included about equal numbers of draft and light breeds. The importations also included 12 swine, 839 dogs, and 12 cats.

More than half of 91,995 animals imported during the last ten fiscal years were cattle. During the last decade 3,156 horses entered, the largest number in 1930, when 446 arrived.

Sheep importations during the last two years were greater than in the preceding two years. The 1935 importations were six less than 1934 when 1,042 sheep were imported.

* * * *

The breeding of pedigreed dogs is a $75,000,000 industry in the United States today. The 5,000 registered kennels have $35,000,000 invested in buildings and equipment and about $40,000,000 more in 400,000 purebred dogs whose average value is at least $100 apiece.—*Colliers* 7-20-35.

* * * *

EXPERIMENT STATION BULLETINS TELL HIM JUST HOW

"Selling Poisons to Farmers" is the title of a recent magazine article. It refers particularly to drugs used in ridding animals of intestinal worms. Any drug that is strong enough to kill a live, wriggling worm in the intestines of an animal is also strong enough to do serious damage to the host, if improperly used. Recently, in a large swine herd, a certain salesman advised the owner that his pigs were harboring many worms, which his capsules would drive from their unhappy homes. Without knowing the previous treatment of these pigs, and having little technical knowledge as to when and when not to treat, the information was dangerous to begin with. The pigs were all duly treated, however, and within two days, several potential makers of hams and bacon had departed for the celestial rooting grounds. To abbreviate this pig tale, over two-thirds of the hogs died within two weeks. It is perfectly true that swine disease was a contributing factor, but it is quite apparent that the incorrect use of the worm treatment was a primary factor in starting the subsequent losses. If the losses had been among humans instead of hogs, it is quite likely that manslaughter charges would be preferred against those giving the treatment. In the present case, however, the owner got a swift kick in the pocketbook, and is sore all over. He knows now that anthelmintics are poisonous and should be administered only by those who know when and how to use them.

College Park, Maryland. MARK WELSH.

Hens are a prey to at least nine species of lice, several species of mites and at least two kinds of fleas, says a poultry specialist. —*S. N. L.*, 28:750.

The first noticeable symptoms of equine encephalomyelitis are disturbance of the appetite, lack of spirit, and weakness. These are quickly followed by sleepiness, grinding of the teeth, walking in a circle, or trying to push or plunge through any obstacle with which the animal comes in contact. Later the animal may go down and although unable to rise may thrash violently with the feet and head. After reaching this stage the animal usually dies. — *U. S. D. A. Press Service.*

Administration of the lacto-vaccine to the non-infected cows in a mastitis-infected herd greatly reduces the spread of infection and in many cases protects all of the non-infected cows from the infection present in the herd. If the eradication program is to extend over a period of years, it is advisable to vaccinate the non-infected animals at least once a year. Heifers that have not been sucked or injured on the udder may safely be bought or raised as replacement animals; however, they should be vaccinated before freshening. It is desirable to eliminate the infected cows as soon as possible to decrease sources of the infective streptococci of mastitis.—*Mich. Agr. Exp. Sta.*

SOFT PORK

Nobody wants soft pork. Feed soybean oil meal instead of soybeans to hogs and produce firm pork. Soybean oil meal for balancing corn produces 10 to 20 per cent faster gains than soybeans, shortens the fattening period one to two months and saves 10 to 20 per cent of the feed. A good ration for economical pork production can be made at the rate of nine pounds of soybean oil meal and one bushel of corn supplemented with alfalfa meal and a mineral mixture. A mineral mixture such as two parts ground limestone, two parts steamed bone meal and one part salt, must be fed with soybean oil meal.—*University of Illinois.*

Scientists studying the effects of diet on experimental animals find that 21 days in the life of an albino rat correspond to 21 months in the life of a child.—*S. N. L.*, 28:750.

Except for snake venoms and a few other poisons, tolerance toward poison increases with repeated small doses.—*S. N. L.*, 28: 750.

HANDLED 1000 ANIMALS A DAY

According to the official report of the American Society for the Prevention of Cruelty to Animals of New York City, the society handled 316,802 animals during 1934 at its five animal shelters, or more than 1,000 for each working day. Of these, 220,680 were cats; 93,548 were dogs and 2,574 were horses and other animals; 13,623 dogs, 14.5 per cent of those handled, were returned to their owners and 4,878 were placed in homes. 15,749 cases were treated at the society's free clinic and 46,302 days of hospitalization were furnished animals of the poor. Agents of the society investigated over 13,000 cases of alleged cruelty to animals during the year and caused 738 arrests, which resulted in 676 convictions. Of the prosecutions, 560 involved charges of cruelty to horses. The society is 69 years old.

Humanely Destroyed!

The Chicago Anti-Cruelty Society responded to 20,373 calls during 1934, on which 28,936 animals —15,587 dogs, 12,706 cats, 495 white rats, 102 pigeons, 14 canaries, 9 bears, four guinea pigs, two rabbits, two robins, one martin and one goat —were picked up. Of these, 61 dogs were returned to their owners and 315 animals were placed in homes according to the official report of the society. It seems if an unclaimed animal is "rescued" by the anti-cruelty folks, it has one chance in 91 of getting away with its life. The society treated from 20 to 30 animals daily in its free clinic—"Please deposit in the box as much as you can afford for the support of the clinic." The expenditures of the society were $17,586.

The anti-cruelty society is erecting an animal rescue shelter at 157 Grand Avenue at a cost of $75,000. It would seem a morgue would serve its main purpose.

Expenditures of the Illinois Humane Society (Chicago), a society with aims similar to those of the Anti-Cruelty Society, were $18,536.

EXAMINATION OF URINE

Of the standard tests generally employed in testing samples of urine the following have been found most satisfactory by Professor George F. Boddie of the Royal (Dick) Veterinary College, Edinburgh, in the routine examination of samples of urine of the domestic animals. The technique was published as an addendum to an article entitled "The Interpretation of Urine Analysis in Diagnosis," in the *Veterinary Record.*

Specific Gravity

Estimated with a hydrometer. Specific gravity in normal animals is subject to considerable variation; the following are the usual figures for the domestic animals.

Horse	1020-1050	average	1035
Cattle	1005-1040	"	1015
Dog	1015-1045	"	1020

Reaction

Determined by means of red and blue litmus paper. In normal herbivora the reaction is alkaline; in dogs it is acid.

Albumen Tests

Heat plus Acetic Acid

Some urine is boiled in test tube, to this are added a few drops of dilute acetic acid, the contents of the tube are again boiled. Coagulation of albumen renders the contents of the tube cloudy. Acidulation is necessary to avoid errors due to the precipitation of earthy phosphates. This test is the only one suitable for herbivorous urine.

Cold Nitric Acid

This test is of considerable value in testing dogs' urine. A layer of concentrated nitric acid is run down the side of a test tube under a layer of urine. At the junction of the two layers a white "fluffy" ring develops if albumen be present. A crystalline layer may develop in concentrated urine, this is not indicative of albumen.

Bile Pigment

In carnivora the presence of bile pigment is demonstrated by the play of colors at the junction of a layer of urine on a layer of concentrated nitric acid. This test is unsatisfactory in herbivora. The addition of a few drops of a dilute solution of iodine gives with bile pigment a green color.

Bile Salts

The presence of bile salts in urine reduces the surface tension of the fluid and flowers of sulphur sprinkled on the surface of a column of urine sink to the bottom if bile salts are present.

Blood Pigment

A few drops of tincture of guaiacum are added to some urine and on the surface of the mixture is placed a layer of ozonic ether. A blue color develops if hemoglobin is present, this may take an appreciable time if the quantity of blood pigment is small. Both reagents must be reasonably fresh.

Sugar

For routine examinations Nylander's bismuth reagent gives satisfactory results. If a reducing sugar is present in the urine on boiling with Nylander's reagent a black precipitate of bismuth oxide is formed. This test is devoid of fallacies due to the presence of glycuronic acid.

Provided care is taken Fehling's reagent gives good results. The two solutions No. 1 and No. 2 should first be boiled together and the suspected urine added and the mixture boiled. Only a prompt reaction should be considered positive. Prolonged boiling may give spurious results.

Indican

A few drops of chloroform are shaken up with some urine and to this is added as much concentrated hydrolchloric acid as urine. To this mixture is added drop by drop a dilute solution of bleaching powder.

The development of a blue-violet color indicates the presence of indican. This color may be removed by the addition of more bleaching powder solution. If only small amounts of indican are present the color may appear and disappear with the addition of only one drop of the bleaching powder solution. The bleaching powder solution should therefore be added slowly.

Acetone

To some urine saturated with ammonium sulphate is added a few drops of a freshly prepared dilute solution of sodium nitroprusside and a small quantity of strong ammonia. The presence of acetone is shown by the development of a permanganate color, the depth of the color being proportional to the amount of acetone present.

Deposits

The deposits may be obtained from urine either by centrifuging or by sedimentation in a conical jar. Films are fixed by heat and for most purposes staining with methylene blue suffices. The recognition of the cell content of the deposits is most satisfactory with an oil-immersion lens. The chief deposits of importance are blood cells, kidney epithelial cells, casts, bacteria and epithelial cells from the urinary passages. Crystalline deposits such as oxalates are occasionally found.

Urea

1cc of urine is introduced into a Doremus urometer filled with an alkaline hypobromide solution. The urea is split up and the nitrogen evolved collected in the closed limb of the urometer. The scale indicates the amount of urea in grams per cc.

The alkaline hypobromide solution should be freshly prepared by mixing equal parts of the following:—

1. A 22% solution of sodium hydroxide.
2. A solution containing sodium bromide 125 grams, bromine 40cc and water to 1000cc.
3. Distilled water.

Nylander's Bismuth Reagent for Sugar

Rochelle salt 40 grams and bismuth subnitrate 20 grams dissolved in 1000cc of an 8 per cent solution of caustic soda.

—*Animal Pathology Exchange.*

* * * *

The Ohio Agricultural Experiment Station has issued an average of 20 bulletins a year during the past 44 years, in the aggregate about 25,000 pages. In addition, an average of four press articles a week have been supplied for the past 22 years.

TETRACHLORETHYLENE IN THE TREATMENT OF HOOKWORMS AND ROUND WORMS

IN 1925 Hall and Shillinger, while investigating the anthelmintic properties of the chlorine derivatives of ethane, ethylene and methane, studied tetrachlorethylene. Previously two workers, Caius and Mhaskar, had shown that an increased chlorine content of a chlorine hydrocarbon compound would increase its vermicidal efficacy. Hall in reviewing this work deduced that some relation existed between the physical properties and the curative indices of these drugs. Hence, with four molecules of chlorine and a ratio solubility of only about one-eighth that of carbon tetrachloride, it must have been reasonable to assume that tetrachlorethylene had more desirable chemical and physical characteristics than any of the other compounds of this group studied by Hall and Shillinger.

Hall and Shillinger found tetrachlorethylene a highly effective anthelmintic in dogs and foxes. Shlingman found this chemical to be practically non-toxic and therapeutically effective for the removal of round worms in dogs, foxes, cats, sheep and horses.

Lamson, Robbins and Ward have published a thorough pharmacological and toxicological study of tetrachlorethylene, based on its action in several hundred animals. They found that it absorbed only to a slight degree from the intestinal tract of dogs. A single dose of 275cc given to dogs produced no apparent injury to the liver and kidneys. Only occasional indications of absorption were observed, especially if fat was present in the diet. These dogs were given 4cc per kilogram of body weight. No pathologic changes were caused by absorption after inhalation. They concluded that the precautions observed in the administration of carbon tetrachloride were unnecessary in giving tetrachlorethylene.

Thirteen persons treated with tetrachlorethylene by Lambert showed that the drug had the same selective action on the female necator as does carbon tetrachloride.

Schapiro and Stall studied the therapeutic properties of single doses of tetrachlorethylene in uncinariasis in humans (adults and children). Patients were given light meals the previous evening and no breakfast in the morning, when 2cc to 3cc were given in a solution of magnesium sulphate. Fractional doses (less than 2cc) were given to patients under sixteen years of age. In doses of 3cc it reduced egg counts 93 per cent, and with 2cc it showed an 81 per cent reduction.

In the treatment of hookworms in humans, of 21 patients, six showed signs of vertigo, six showed emesis, two developed hysteria and two had visual disturbances.

Slight vertigo and nausea following ingestion of tetrachlorethylene may be regarded as evidence of its absorption via the intestinal tract. As shown by Lamson, this occurs sparingly in animals if at all. In humans the duration of side reactions was short in every instance with an absence of residual evidence of liver necrosis and guanadine intoxication which occasionally results from the use of carbon tetrachloride in effective dosage.

Hall and Augustine, in the use of tetrachlorethylene, suggested that nausea is probably due more to magnesium sulphate than to tetrachlorethylene for the reason that the symptoms disappeared as soon as purgation was effected. Evidence seems to favor the conclusion that tetrachlorethylene is not absorbed to any appreciable extent. Furthermore all data in the pharmacological and clinical studies of this chemical indicate that it is practically non-toxic for man and animals.

There is a tendency to purgation in some patients after an effective dose of the drug. It has produced some nervous and gastric symptoms in its use in both man and animals. No preparation of the patient is necessary prior to the administration of the drug except the omission of the meal immediately preceding.

Food ingestion and especially fat, should be avoided until there is evidence of complete elimination of the drug.

Dosage: Dogs or foxes weighing 8 to 10 pounds, give 1cc; weighing 10 to 20 pounds, give 2cc; weighing 20 to 30 pounds, give 3cc, or add 1cc for each 10 pounds above 20. For puppies weighing 2 pounds, give 0.3cc; 2 to 4 pounds, give 0.4cc; 4 to 6 pounds, give 0.6cc, and for puppies weighing 6 to 8 pounds, give 0.8cc.

From the evidence compiled by its various investigators, this drug is entitled to a favorable position among the anthelmintics now in use. The doses recommended in the foregoing are given by Milks in his text, "Veterinary Pharmacology and Therapeutics."

D. Ehrlich,

Brooklyn, N. Y.

* * * *

SARCOPTIC SCABIES IN THE DOG

ALTHOUGH the dog is the species most often attacked, this parasite, *Sarcoptes scabiei* var. *canis*, has been known to infest other animals and in rare cases to attack even man.

The distribution of this parasite is worldwide; wherever dogs are kept, there the disease will be found in varying degrees of intensity. Because of its wide distribution and frequency it is of great economic importance, for many dogs die either directly or indirectly from this infestation, and large sums of money are spent annually by dog owners for the treatment of their pets.

The mite gets on the skin and burrows tunnels into it. The female after depositing her eggs in the depths of the tunnnel dies. The ova develop into larvae, in the epidermis, in about three or four days. As the skin is always wearing off and constantly being replaced from below, the eggs are usually close to the surface by the time they are ready to hatch. The parasite by mechanical and toxic action irritates the tissue causing the formation of the "pimple." Sarcoptic infested epidermis is thicker than normal, the layers being hyperplastic. The granular layer becomes easily visible and mononuclear lymphocytes infiltrate the mu-

cous malpighian layer. Some of the serous exudate unites with leucocytes and frequently erythrocytes, pushing apart the epidermal cells of the region and causing the formation of a vesicle.[1] The larvae instead of coming directly to the surface, to complete their development, may go deeper into the skin and remain there for some time. In this position they are protected from the action of drugs. Ordinarily, however, maturity is reached in ten to twelve days during which time the parasite undergoes three molts. The progeny reproduce again in fifteen days.[2]

The mite is transmitted by contact, but healthy young dogs resist the disease more than unhealthy ones. It appears that some predisposing factor is necessary but this has not been proved.

The head, abdomen, thighs, neck, chest and root of tail are the regions most often affected, although the disease may be found on any part of the body.

Itching is the first symptom and this tendency is augmented by the presence of external heat or by exercise, as after a long run or when brought from a cold atmosphere into a warmer one. The skin is red and inflamed, and nodules a trifle larger than a pin-head appear. The animal in scratching ruptures the pustules, which dry and leave a scab, that peels off leaving a raw surface through which pus-producing organisms may enter. The color is diagnostic. The epidermis scales, accompanied by a patchy shedding of the hair. This exfoliation has a tendency to adhere to the clothing and bedding. The skin and hair are dry, thick, and lacking in pliability. If a scab is removed an exudate of serum and leucocytes appears. If a scraping is made under a scab and examined with a microscope the parasite will be found.[3]

If the sarcoptic mange is not checked the animal may die, usually in the course of three months. The pathogenicity is increased by low vitality of the individual, due to internal parasitism or any debilitating disease.

Because of its wide prevalence sarcoptic mange is a difficult disease to eradicate. It is customary for tourists to take their dogs with them on trips, and this practice facilitates the spread of the disease. It is, however, possible to protect healthy individuals by keeping them away from both positive and suspicious cases of mange. By keeping the dog in good general health and especially free from internal parasites the danger of contracting the disease will be greatly lessened.

Treatment is more successful in sarcoptic than in demodectic mange; in fact with judicious treatment recovery is the rule, but as in other diseases the prognosis depends on the stage and severity of the condition. In long-haired animals it is necessary to clip the whole body. The skin should be cleaned thoroughly, and all scabs removed with warm soapy water. If the disease is localized care should be taken not to spread the parasite in the cleaning process. Vigorous treatment is advisable even in the early stages, and frequent inspections should be made to determine if the condition is spreading. Oleaginous preparations are especially effective since they penetrate deeply and adhere to the skin for a long time. A generous application accompanied by a vigorous rubbing is essential for good results. Mixtures containing sulphur have proved to be as effective as any other. Ordinary sulphur ointment rubbed well into the affected skin will often bring about a prompt and permanent recovery but lime-sulphur dip is especially useful. In conjunction with the specific treatment nourishing food and mild laxatives should be given and the surroundings kept clean.[3]

References

1. Hutyra and Marek—Pathology and Therapeutics of the Diseases of the Domestic Animals —Vol. I.

2. Microscopic Lesions of Mange—*American Journal of Veterinary Medicine*—Vol. XIV. 1919.

3. Sarcoptic and Follicular Mange—*North American Veterinarian*, Vol. II, p. 236.

R. L. FORTUNE.

Pulaski, N. Y.

THE AMERICAN PUBLIC HEALTH ASSOCIATION

The American Public Health Association was organized in 1872 by a small group of sanitarians who saw the great need for accumulating existing public health knowledge, and making it available to public health workers, that they might have a comprehensive viewpoint of the whole public health movement.

From a small beginning, it has grown steadily, until today it is the largest and best-known public health organization on this continent, including among its 5,000 members the leading authorities in every branch of public health and preventive medicine.

For more than sixty years the Association has served North America as the leading professional organization for the promotion of public health. it aims to develop public health standards, to stimulate the recruiting and training of public health personnel, and to strengthen the public health profession.

The permanent objective of the American Public Health Association is the effective control of preventable disease, and the security of health for all the people.

Active membership is limited to professional public health workers in the United States, Canada, Cuba and Mexico.

Associate membership is open to health workers in other countries, and to anyone interested in public health.

The annual dues are $5.00, including The American Journal of Public Health and the annual Year Book are sent free to all members.

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PRACTICE IN CHARLESTON

Dr. S. E. Hershey, of Charleston, West Virginia, reports something of a coincidence, or perhaps a series of them, when he had in his hospital recently a Great Dane weighing 180 pounds, with a fractured femur, and a Chihuahua weighing one and one-half pounds, and a yearling camel with an ankylosed elbow; and as out patients, at about the same time, an 18-year-old mare that had foaled twins, a sow with 19 pigs (11 of which survived), and a cow with triplets. Doctor Hershey reports that rabies has been prevalent in the vicinity of Charleston for more than 18 months and during that time, the loss among animals that he has personally seen, has been: Dogs, 262; cattle, 162; cats, four, and horses, two and there have been two deaths of persons.

ORGANIZED MEDICINE ON THE AIR

Health by radio drama is being introduced on a nation-wide network under the sponsorship of organized medicine. The new radio program began October 1, 1935. The sponsor is the American Medical Association. The programs will be furnished to the Blue network (WJZ, WSYR, KDKA, WCKY, WENR, WIBA, KSTP, WEBC, KFYR, KWCR, WREN, KWK, KSO, WBAL, WMAL, WTAR, WPTF, WWNC, WSOC, WIS, WSM, WMC, WJDX, KVOO, WKY, WFAA, KTBS, WOAI) each Tuesday at 5:00 p. m., Eastern Standard Time (4:00 p. m. C. S. T.).

The broadcasts are under the supervision of the Bureau Health and Public Instruction of the A. M. A., of which Dr. W. W. Bauer is Director. Dr. Morris Fishbein and Dr. Bauer alternate in delivering brief talks connected with the dramatized programs.

* * * *

VITAMIN D-SPARING ACTION OF MAGNESIUM STUDIED IN CALVES

When the magnesium content of the diet is increased above that provided by natural foods, several workers have shown that calcium retention is favored. Euler and Rydbom and Kay attribute it to an increased activity of the enzyme phosphatase, which is concerned in the bone forming process.

Huffman and his associates, at the Michigan Experiment Station, observed this effect of high magnesium in a single calf, and Huffman and Duncan have recently reported after a study of twelve calves that additional magnesium in the diets checked or prevented rickets, even though the vitamin D of the diet was, by itself, inadequate. On the other hand, a high magnesium intake did not check rickets in the complete absence of vitamin D.

Bone analyses indicated better calcium and phosphorus utilization due to the magnesium supplement, and the authors conclude that the magnesium content of feeds for dairy cattle may contribute to their antirachitic effect.—*Vitamin D Milk,* Vol. II, No. 7.

UNUSUAL TAPEWORM CYSTS IN A RABBIT*

Unusually long and slender cysts of the dog tapeworms, *Taenia pisiformis*, were removed from the common rabbit (*Sylvilagus floridans mearnsi* Allen) taken at Manhattan, Kansas, July 23, 1935, by Mr. Ivan Pratt, who placed the material at my disposal.

These larvae, 25 in number, were lying free in the peritoneal cavity. They were long and narrow in contrast to the usual rather broad pea-shaped appearance of the cysts of this species. The larvae were distributed all through the rabbit's peritoneal cavity and showed some movement. These specimens were taken to the zoological laboratory of the Kansas State College and properly fixed, stained, cleared and mounted.

The mounted larvae were studied critically for identification. The inturned scolices had the appearance of those of normal *Cysticercus pisiformis*. They had two rows of hooks on the rostellum, each row with 18 to 22 hooks; the large hooks ranged in length from 0.198 to 0.278 mm., and the small hooks from 0.131 to 0.164 mm. in length; the cysticerci as a whole ranged in length from 16 to 28 mm., and in width from 3 to 5 mm. as compared with a length of 5 to 9 mm., and a width of 3 to 7 mm. for the normal cysts. From this study of the form of the scolex and the number, size and shape of the hooks, the unusual cysts are undoubtedly *Cysticercus pisiformis*.

A veterinarian in general practice will explain to his client that these bladderworms in the peritoneal cavity of the rabbit are the larval stages of the dog tapeworm *Taenia pisiformis*. I have seen farmers shoot rabbits for dog food and wonder why the dogs did so poorly when they were so well fed. When autopsying dogs I have often found their intestines packed with these tapeworms which are large and range in length from 20 to 75 inches, the average of which is about 30 inches.

* Acknowledgment is made to Dr. J. E. Ackert for confirmation of the identification.

In addition to *Cysticercus pisiformis*, the rabbit harbors the larval stage of another dog tapeworm, *Multiceps serialis*, which is more or less imbedded in the connective tissues of the rabbit.

Thomas C. Hinkle, Jr.,
Kansas State College, '36.
Manhattan, Kansas.

* * * *

PARALYSIS FROM SPINAL PRESSURE

On August 10th, after a night of severe electrical storms, I was called to see a nine-year-old mare mule, running at pasture, suffering from posterior paralysis. The animal was standing and appeared to be in excellent condition. The conjunctiva was normal; temperature 101.2°F.; pulse 45, strong and regular; breathing normal in rate and type; peristalsis, evacuation and urination, normal.

When walked, both the animal's hind legs seemed to move rather awkwardly and with a slight sway at each step. No line of singeing could be found on the animal. A diagnosis of partial posterior paralysis was made, and the cause tentatively charged to poisoning by choke cherry leaves or pressure along the spinal cord.

Treatment consisted of a brisk liniment to be rubbed along the hind legs. Two weeks later, a second call was made and during that interval this case had twice been diagnosed as lightning stroke. The animal had become progressively more paralyzed in the hind quarters and had gone down three days before my second call. In struggling she had bruised her head, hips and buttocks. The temperature was 100.0°F.; pulse 60, regular but weaker than before; the conjunctiva was congested somewhat; breathing slightly faster than normal and the peristalsis almost imperceptible. She was lying on the right side. No feces or urine had been passed in 30 hours. The rectum and vagina were enormously swollen, edematous and protruding. Vaginal examination revealed a tense condition of the walls and greatly swollen edematous mucosa. The rectum likewise on exploration,

revealed a thick and edematous condition, but the walls were loose, flabby and without tonus. Both conditions might at least in part have been due to lay manipulation of the parts. The diagnosis was a tumor along the spinal cord; the prognosis, unfavorable.

The next day, the fifteenth day after the first noticeable symptom, the animal died. A postmortem examination was held 30 hours later, during hot weather; thus making useless for diagnosis all the soft tissue changes found. Just behind the last rib, under the spinal column and somewhat to the left of the median line, was an osteoma of the size of a goose egg. From all appearances, it was of long continued, slow growth.

THEODORE E. JABBS.
Endicott, New York.

QUINTUPLET CALVES

The illustration shows a grade Guernsey cow and a "litter" of five calves that I was called upon to deliver. The cow's recovery was uneventful.

The fetuses were of approximately the same size. Unfortunately, the photographer took the picture from an angle so that they appear of different sizes in the lower photograph. W. C. KAILER.
Natchez, Mississippi.

STATE BOARD EXAMINATION QUESTIONS

A recent examination given by a state board of veterinary examiners to applicants for a license to practice veterinary medicine in a midwestern state, including the following:

Chemistry

1. Define molecule.
2. What is an (1) ion; (2) proton; (3) atom?
3. What is biological chemistry?
4. What is chemotherapy?
5. Give the symbol of (1) Potassium; (2) iron; (3) copper; (4) calcium; (5) phosphorus.
6. What is (1) H_2O_2; (2) H_2SO_3; (3) HCL; (4) NaCl?
7. What is (1) glonoin; (2) muriatic acid; (3) lunar caustic; (4) common salt?
8. What is a galencial?
9. What is the chemical formula of glucose?
10. Who was your professor of inorganic chemistry?

Pathology and Bacteriology

1. Define abscess.
2. What is meant by croupous?
3. What are the distinguishing characters of a malignant new growth?
4. Name the specific organisms of (1) tuberculosis; (2) tetanus; (3) swine erysipelas; (4) blackleg; (5) undulant fever.
5. What is (1) hyperesthesia; (2) hypoglycemia; (3) hyperthermia; (4) hydroarthrosis; (5) osteomalacia?
6. Give the life cycle of the *Ascaris suis.*
7. Explain the etiology of Texas fever.
8. What is hemolysis?
9. What is an (1) agar slant; (2) bouillon; (3) hanging drop?
10. Name some of the more common stains used in bacteriological work.

Anatomy

1. Describe the sacrum.
2. Name the structures within the hoof.
3. Describe the arytenoid cartilage.
4. Name four of the important cranial nerves.
5. What bones in domestic animals are not connected with the general skeleton?
6. Name the structures constituting the forearm.
7. What is the epidural space?
8. Name the glands of internal secretion.
9. Give the capacity of (1) the stomach of the horse; (2) the rumen of the ox; (3) the colon of the horse; (4) the gall bladder of the dog.

10. Who was your professor of anatomy? What was your text book on anatomy?

Physiology

1. What is the function of blood sugar?
2. Where is glycogen found in the body?
3. What is the function of the vagus?
4. What do the following ducts convey: (1) Lacrimal; (2) Steno's; (3) ductus choledochus; (4) fallopian tube?
5. Describe the functions of the corpus luteum.
6. Define (1) borborygmus; (2) peristalsis; (3) estrum; (4) blood pressure; (5) chymification; (6) metabolism.
7. What is the parasympathetic system?
8. What are the functions of (1) saliva; (2) bile; (3) tears; (4) synovia?
9. Describe (1) the trot; (2) the pace; (3) the canter; (4) the gallop.
10. Who was your professor of physiology?

Obstetrics

1. Define fetal and maternal dystocia.
2. Give the period of gestation in the (1) mare; (2) cow; (3) sow; (4) bitch.
3. When is Cesarean section indicated?
4. How would you handle a case of retained afterbirth in the cow?
5. Name the maternal sequels of parturition.
6. Name the common causes of fetal death.
7. Name three authors of classical works on veterinary obstetrics.
8. Describe the administration of epidural anesthesia in the bovine species.
9. Locate the following (1) Pavilion; (2) Graafian folicle; (3) myometrium; (4) cotyledon.
10. Describe the uses of pituitary extract.

Surgery

1. Name the drugs commonly used as local anesthetics.
2. Describe the administration of chloroform.
3. What is shock, its prevention and treatment.
4. Name the various methods of arresting hemorrhage.
5. What is the treatment for excessive blood loss?
6. Describe Williams' operation for laryngeal paralysis.
7. What are the post-operative sequels of castration?
8. How would you treat fracture of the femur in a dog?
9. What are the common accidents of surgical restraint?
10. Name three fatal wound infections.

Sanitary Science

Describe briefly the prophylaxis of (1) tuberculosis; (2) anthrax; (3) tetanus; (4) Bang's disease; (5) pullorum disease; (6) Texas fever; (7) fowl cholera; (8) canine distemper; (9) hog cholera and (10) swine erysipelas.

How good is your memory? How many of the foregoing can you answer?

OLEO WAR

In 1932 the dairy men of Wisconsin put a 6c a lb. tax on oleomargarine, hoped that a bigger consumption of their butter would result. Meantime butter prices went down. Between the margarine tax and low butter prices they got what they wanted.

Last year butter prices started up again. Last summer Wisconsin dairy men put a 15c a lb. tax on margarine.

Big ingredient in margarine is cotton seed oil and thereby hangs a tale of what may prove a bitter section fight.

Cotton growers are mad. They say they're going to boycott all Wisconsin products. And they've given evidence that they mean what they say.

According to reports a Carnation Milk salesman (Carnation Co., Milwaukee, Wis.) came back from his usual Southern trip to report hardly any sales at all. And the Jelke Co. (big oleo manufacturer) announced that it is cancelling its business—around $350,000 annually—with the Menasha Carton Co. (Menasha, Wis.)—*Exchange.*

AVOIDING "WATER SEEDS"

I read with interest, Doctor Baker's technique for the castration of colts. A suggestion may be helpful to others. His method of preventing hydrocele which so frequently follows the operation in mules, can be improved upon.

Incise the tunics, exposing the testicle, but do not sever the tunics from the testicle as this will afford a firm grip to lower all of tunic possible and then place emasculator over the cord and all of the tunic, removing each testicle and tunic with one operation.

By following the above procedure on hundreds of colts, as well as mules, I have not had one with a water seed. We deem a hydrocele a fault of the operation. Once I removed ten "waterseeds" from six mules previously operated upon by a professional "castrator."

L. E. THOMPSON.

Waxahachie, Texas.

Liability for Water Pollution

By LEO T. PARKER,
Attorney at Law,
Cincinnati, Ohio

FREQUENTLY, veterinarians are required to minister to cattle, and other animals, whose sickness results from drinking water from a polluted stream. In many instances veterinarians are called upon to testify as to the rights and liabilities of the parties. Therefore, the purpose of this article is to review the most recent cases in which the higher courts have fixed liability for water pollution. This information can be utilized with dependability by veterinarians who desire to assist in preventing further pollution of the water.

First, it is important to know that any person who permits poisonous substances (including infection) to enter a stream of water, thereby polluting the water, may be held liable in damages to the owners of animals down stream, if a veterinarian's testimony is favorable.

For illustration, in Bradley v. Consolidated Co., 298 Pac. 324, it was shown that a firm permitted poisonous matter to enter a stream of water. The cattle owned by a lower property owner were poisoned. The owner of the cattle sued the company for damages. The lower court held the company liable, and the higher court sustained the verdict, saying:

> Upon the question of whether the cattle were affected by arsenic poisoning, the evidence, as upon the other questions, is in direct dispute. The veterinarian called by the respondent (cattle owner) to examine and treat the cattle testified that in his opinion the cattle had been poisoned. . . . Whether the appellant (company) was guilty of negligence . . . was also a question for the jury.

City and Private Industry Liable

The legal question often has arisen whether or not a city and a private company may be held jointly liable in damages to a property owner whose water is polluted as a result of acts on the part of both the city and the private company. Ordinarily, although both may be liable in damages for polluting the water, each offender will be held liable proportional to the responsibility for the water pollution. Another question is: Is a city or a company liable for polluting water, if such pollution does not result from negligence?

For example, in Johnson v. City of Fairmount, 247 N. W. 572, it was disclosed that a city maintains a septic tank with a capacity of 400,000 gallons per 24 hours, the effluent from which is discharged into a stream of water. Also, a canning company operates two canning factories in the city which dump waste matters into the stream. Although there are different offensive odors coming from these two sources, undoubtedly the sewer odor from the city tank is more constant and offensive than the sour odor from the canning factory.

The owner of property whose cattle drank from the stream filed suit against both the city and the canning company, and asked the court to hold the two jointly liable in damages for polluting the water of the stream.

The counsel for both the city and the canning company argued that the property owner could not recover damages, unless he proved that the water was polluted as a result of negligence. However, the court held the property owner entitled to a judgment, saying:

> The question of negligence is not involved. A nuisance does not rest upon the degree of care used, but rather upon the danger, indecency, or offensiveness, existing or resulting, even with the best of care. . . . The serious question before us is whether tort-feasors acting independently, each causing damage, may be held jointly liable in an action for damages. . . . If the damage caused is the combined result of several acting independently, recovery may be had severally in proportion to the contribution of each. . . . If, however, they are acting jointly in the premises, then they may be jointly or severally sued for the entire damage.

Proving Liability Is Technical

Obviously, where a suit is filed against both a municipality and a private company either one or both may be held solely responsible.

For example, in the recent case of City of Enid, Oklahoma, Champlin Ref. Co. and Eason Ref. Co., it was shown that suit was filed by a private property owner, named Mrs. Brooks, to recover damages amounting to $25,000 due to the contamination of the water in a stream by the sewage of a nearby city and the wastes from a refinery. Also, she contended that two wells were polluted and that odor nuisances were caused by these wastes, as well as causing the water to be unfit for domestic purposes or for use of cattle and other animals on the farm.

The case was tried before a jury and resulted in allowing Mrs. Brooks $1,500 damages due to the wastes from the refinery. However, the city was held *not* liable for any damages, because it was proved that sewage from the city amounting to approximately only 1.5 m.g.d. is discharged into the stream about three miles above the property of Mrs. Brooks.

Complaining Party Must Prove Pollution

It is a well established law that any person who claims damages against a municipality, private company, or individual, for an injury or damages caused by water pollution is bound to prove with reasonable certainty the extent of the injury and, also, that the damage actually was caused by water pollution.

For illustration, in O'Hair v. California, 20 P. (2d) 375, it was shown that a packing company, by permission of a city, connected the sewer pipes of its plant with the sewer system of the city. The waste waters from the company's plant, together with the sewage of the city, were conveyed through the septic system of the municipality and discharged into a slough on property used by the owner for the purpose of fattening cattle.

Neither the packing plant nor the city obtained the consent of the property owner to thus dispose of the waters and the latter filed suit for damages, claiming that the waters from the plant are impregnated with lye and other chemicals and that this condition creates offensive odors, makes the waters of the slough unfit for live stock to drink, and injures the land for farming purposes.

However, since the property owner failed to definitely prove when the injury was sustained, or any of the other contentions, the higher court refused to allow damages, and said:

> The elements of damage being based upon disagreeable odors and impregnation of the waters with chemicals, making the use thereof unfit for stock-watering purposes, and injurious to the lands for farming purposes, not having been established, the finding that plaintiff suffered no damage must be sustained.

On the other hand, positive and complete proof is not required, if a court may with reasonable certainty determine that the party being sued is responsible for the pollution.

For illustration, in Corporation v. Palmer, 30 P. (2d) 189, it was disclosed that the owner of property filed suit against a corporation alleging that waste material from the corporation's plant polluted the stock water supply by which cattle were poisoned, causing the death of some of them and injury to others, all to damage in the sum of $950.

It was contended by the corporation that the farm owner was not entitled to a judgment because he did not prove that the cattle could not have been poisoned by other means, and, also, because after knowing that poisonous water was present in the stream he deliberately put the cattle in the field through which the stream flowed. However, notwithstanding this contention the higher court held the landowner entitled to recover damages, saying:

> It is true that there is no direct evidence that any of plaintiff's cattle drank water from the "common draw"; . . . Considering all the inferences and conclusions the jury was justified in drawing from the evidence.

Therefore, it is quite apparent that a property owner is not required to prove

positively that certain damages complained of, as where cattle die, resulted from the cattle actually drinking poisonous water. It is sufficient if proof is introduced showing that the water is poisonous and that the cattle were in the field through which the stream flows. In other words, if it is definitely proved that the cattle were in the field containing poisonous water, the court may infer that drinking the polluted water caused their death, although no evidence is introduced proving that the cattle actually were seen drinking the water.

The reason for this rule of the law is that it is evident and obvious that cattle must drink water, and since their water supply is poisonous, it may be inferred that drinking the water is accountable for their death.

This same rule of the law is applicable in all other cases involving proof of injury or damage resulting from polluted water. If the complaining party fails to prove that the water actually is polluted, he cannot have a recovery no matter how much evidence he introduces pertaining to the injury. However, if he proves that the water is polluted and, also, proves by inference that the polluted water caused the injury, he is entitled to a verdict.

New Landowner Not Entitled to Recover

Considerable discussion has arisen from time to time whether or not the purchaser of property is entitled to sue and recover damages as a result of pollution of water which condition had existed when he purchased the property. This point of the law was discussed in the recent case of Bowie v. Vann, 59 S. W. (2d) 180.

In this case it was shown that nine years before a new owner purchased a farm, sewage had been discharged into a stream running through the property. The new owner of the land filed suit to recover damages contending that he had the legal right to recover such damages, as the former owner may have had the right to recover. However, the higher court held otherwise, and said:

> Plaintiff (land owner) acquired the property with its market value already depreciated by reason of the permanent nuisance and therefore he is in no position to claim damages to which such former owner alone was entitled.

Right to Injunction

Generally speaking, any acts which cause pollution of water are illegal, and may be enjoined by a higher court. However, it is well established law that circumstances may exist under which a court may properly refuse to grant an injunction when it appears that greater injury and inconvenience will be caused by granting the injunction than will be caused by refusing it. This point of the law was decided in the late case of Gibson v. City of Tampa, 154 So. 842.

The facts of this case are that a suit was filed by a property owner to enjoin a corporation from polluting water. The counsel for the corporation contended that the injunction should not be granted because the cost to the corporation to prevent pollution would be greatly in excess of the damage to the property owner. In upholding this contention, and refusing to grant the injunction, the court said:

> A court may properly refuse to grant an injunction when it appears that greater injury and inconvenience will be caused by granting the injunction than will be caused by refusing it.

The Law of Damages

Obviously, however, the property owner always is entitled to recover damages for injury to his cattle or property although the court may under certain circumstances refuse to grant an injunction to stop further pollution.

Yet, it is important to know that the courts have consistently held that if in the natural and ordinary course of events it becomes necessary for one property owner to discharge a reasonable amount of sewage or impure substances in a stream, he may do so even though it may render the water somewhat unsafe to be used by another owner whose property is situated farther down the stream.

In order to determine whether or not the pollution of a stream caused damages to a property owner, it is not enough to

determine the extent and nature of the impurities projected into the stream. The location of the property and the use to which it is devoted must be taken into consideration, as well as the effect upon such use by any impurities in the stream, and the extent to which the pollution of the water may have been attributable to other sources and causes.

Whether or not use or detention of water is reasonable must be determined by the extent and capacity of the stream, the uses to which it has been put and the rights that other owners may have upon the same stream. What is the reasonable use of a stream depends upon the peculiar circumstances surrounding the case and the uses which are made of the stream by owners below, and whether or not the pollution by an upper property owner essentially impairs the usefulness of the stream to lower property owners.

For example, in Kyser v. New York, 271 N. Y. S. 182, a higher court recently said:

> It is well settled that while a property owner does not own the running water he has the rights to a reasonable use of it as it passes by his land. All other owners upon the same stream have the same right, the right in no one is absolute but is qualified by the rights of the others to have the stream substantially preserved in its natural size, flow and purity and to protect it against material and unreasonable diversion or pollution. . . . The lower owner must submit to such loss or pollution as is caused by reasonable use. . . .

EXTENSION OF PARASITES

A circumstance showing how the range of animal parasites is being constantly extended transpired at the summer clinic of the Eastern Iowa Veterinary Association, when a practitioner from the northern part of the state exhibited specimens of a fatal case of kidney-worm infestation in swine. The case occurred, in a shipment of southern hogs, on a Chickasaw County farm. Stephanuriasis is, as yet, a rare disease of hogs in Iowa, but no section to which southern hogs are shipped for feeding can long hope to remain free from *Stephanurus dentatus* infestation.

FIVE MORE STATES FREED OF CATTLE TUBERCULOSIS

Five more states have been officially designated as modified accredited areas by the U. S. Department of Agriculture, signifying their practical freedom from bovine tuberculosis. These states, Massachusetts, South Carolina, Georgia, Alabama, and Louisiana, constitute the largest group ever admitted, at one time, to the modified accredited status in the history of eradication work.

The advanced status of the work in these five states brings the total of modified accredited areas to 31 or nearly two-thirds of the 48 states.

LEGAL PRINCIPLES OF MILK CONTROL

As the result of a number of decisions of the United States Supreme Court on the constitutionality of the control of milk and milk products by states and their political subdivisions, the following legal principles may be adduced:

The state may require licenses or permits for the sanitary production and distribution of milk and milk products and may delegate the administration of such licenses or permits to ministerial boards or officers, but the licensing power must be exercised in a reasonable manner and without discrimination.

Standards for milk and milk products, adopted by states and municipalities in the interests of the public health, form a valid exercise of the police power of the state.

Requirements by a city that all milk shipped into the city shall be produced in a sanitary manner from cattle free from diseases dangerous to the public health and that impure and unwholesome milk may be confiscated and destroyed do not violate the constitutional rights of individuals.

Prohibition, by a state of the entry of cattle suffering from diseases transmissible to man, either directly or through infected milk, is justifiable under the police power and is not an unwarranted interference with interstate commerce.

A state may adopt legislation providing for reasonable regulation of the minimum and maximum wholesale and retail prices of milk, but such regulation will not apply to milk shipped lawfully in interstate commerce.—*Public Health Reports.*

The Clinical Treatment of Retained Corpus Luteum in the Cow*

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THE condition known to veterinarians as retained corpus luteum has been known for about forty years, but the exact cause still appears unknown. Two theories are advanced in explanation of this phenomenon. The first is that the condition is associated with infections of the tubular genital organs. Albrechtsen[1] is one of the more notable defenders of this view. A second theory, in which Theiler and Green[2] appear to concur, is that retention of the corpus luteum is associated with rations deficient in phosphorus.

Different writers attach varying importance to this condition as a cause of sterility. Poulsen[3] reports having observed a herd in which 70 per cent were sterile because of this condition. In a series of 292 cows and heifers treated for sterility by the writer, 62 were diagnosed as having a retained corpus luteum. In all these cases an effort was made to detect abnormalities of all parts of the genital tract, and no cases were listed in this group which had recognizable abnormalities of the vagina, cervix, uterus, oviducts or other ovarian pathology. A resume of these cases is presented. The method of treatment used was the manual expression of the corpus luteum from its site in the ovary whenever possible. In a few cases, when estrus occurred, the vagina was douched with a physiological saline solution before breeding.

Summary and Discussion

There are listed in Table I, 62 cows and heifers treated for retention of the corpus luteum, eight of which were treated twice for the same condition. In four instances treatment was by ovarian massage as the corpus luteum could not be dislodged, and in 66 instances by partial or complete removal.

A study of the data presented reveals nothing as to the nature of the cause of the condition. All cases were examined carefully, and those listed were free from recognizable infectious processes. Some of the cows were on rations deficient in phosphorus, others had an abundance of this element. Some of the cows received an adequate amount of exercise and in others this was reduced. There was nothing to indicate a seasonal occurrence.

In four instances it is not known whether or not estrus occurred following treatment. In one instance estrus occurred and the cow was bred and conceived at an unknown time. In the remaining 65 instances the time at which estrus occurred was noted as shown in Table II. It will be noted that 70 per cent of the cases treated by expressing the corpus luteum showed estrus within 10 days after treatment. It is known that several of the cases listed as showing estrus at from 25 days on, had ovulated previously, since on examination two weeks after treatment a new corpus luteum was observed, sometimes in the ovary treated, at other times in the one opposite. In these cases the ovulation must have occurred either without estrus, or without its being recognized as such. There is, of course, the possibility of failure to observe estrus because of lack of alertness on the part of the caretaker, or because of a short estral period occurring at night. An instance was observed in which estrus was present, yet none of the usual symptoms of excitement were manifest. This cow was treated by expression of the corpus luteum and, on inquiry a few days later, was reported to have shown no signs of estrus. The cow was examined to determine whether or not

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TABLE I

Retention of Corpus Luteum

Case	Age	Time since last estrus when treated	Treatment	Estrus observed after treatment	No. of times bred	Result: Conceived / Failed to Conceive	Ovary treated produced ovum fertilized
11	3		Expressed C.L.	3 days	1	+	—
170	5	3 mos.	"	8 days	1	+	—
19	13	3 "	Expressed. Vaginal douche at estrus	3 "	2	+	+
08	3	6 "	Expressed C.L.	4 "	1	+	—
C75	1	6 "	"	3 "	3	+	+
F2	3	3 "	"	2 "	1	+	+
F3	3	5 "	"	6 "	1	+	+
233	4	8 "	"	3 "	Not bred	Slaughtered one week after treated	
141	8	6 "	Expressed. Vaginal douche at estrus	4 "	2	—	
D5	1	3 "	Expressed C.L.	46 "	1	+	+
G11	3	2 "	Expressed. Vaginal douche at estrus	4 "	1	+	—
276	2	2 "	Expressed C.L.	4 "	3	+	+
122	5	4 "	Expressed. Vaginal douche at estrus	3 "	2	+	—
20	1	3 "	Expressed C.L.	6 "	3	+	+
G18	2	3 "	Expressed C.L.	5 "	2	—	
		3 "	"	?	Slaughtered 28 days after last treatment		
69	1	2 "	"	5 "	1	+	—
D15	2	5 "	"	29 "	1	+	+
G9	4	5 "	"	17 "	1	+	+
88	1	4 "	Expressed. Vaginal douche at estrus	9 "	4	+	+
60	9	5 "	Expressed C.L.	9 "	4	+	—
121	6	4 "	"	22 "	3	—	
170	6	3 "	"	3 "	1	—	
		2 "	"	4 "	1	+	+
274	3	3 "	"	5 "	1	+	—
176	4	4 "	"	47 "	1	+	+
12	4	3 "	"	2 "	1	+	—
244	1		Expressed. Vaginal douche at estrus	7 "	3	+	+
245	5	3 "	Expressed C.L.	2 "	2	+	—
D6	3	3 "	"	3 "	1	+	—
241	7	3 "	"	3 "	2	+	+
D10	3	2 "	"	29 "	1	—	
		2 "	"	6 "	1	+	—
63	7	4 "	"	21 "	3	+	+
G11	5	2 "	"	29 "	3	+	—
C83	2	8 "	Expressed partially	?	1	+	+
C112	1	5 "	Expressed C.L.	38 "	1	+	+
C113	1	2 "	"	25 "	1	Died 3 weeks after treatment	
C98			Expressed partially	?			
	1	4 "	Expressed C.L.	6 "	1	+	—
G20	3	4 "	"	21 "	1	+	+
D13	3	2 "	"	6 "	2	+	+
G9	6	4 "	Expressed partially	?			
		2 "	"	5 "	1	+	—
D15	3	3 "	Expressed partially	5 "	1	+	+
G10	6	2 "	"	3 "	1	+	—
120	7	3 "	"	19 "	2	+	+
G15	4	2 "	Massaged ovaries	9 "	2	+	
190	2	4 "	Expressed C.L. partially	9 days	3	+	—
D8	5	2 "	Massaged ovaries	22 "	2	+	
D5	5	3 "	Expressed C.L.	5 "	1	+	—
D9	5	3 "	Expressed C.L.	26 "	1	+	—
D13	4	2 "	Expressed. Vaginal douche at estrus	6 "	1	+	—
D7	5	2 "	Expressed. Vaginal douche at estrus	27 "	1	+	+
D15	4	3 "	"	51 "	1	+	—
D12	5	3 "	"	3 "	1	—	
		2 "	"	5 "	1	+	—
C112	2	5 "	"	Slaughtered 21 days after treatment			
G31	4	3 "	"	3 "	1	+	—
186	3	3 "	Expressed partially	13 "	1	+	—
171	8	5 "	Massaged ovaries	18 "	3	+	
249	6	2 "	" "	8 "	1	—	
		3 "	Expressed C.L.	2 "	2	+	—
D10	6	3 "	"	3 "	1	+	+
C83	5	5 "	"	8 "	1	—	
		2 "	"	25 "	1	+	+
D8	6	2 "	"	5 "	1	+	—
C118	4	2 "	"	7 "	2	+	—
A2	2	4 "	Expressed. Vaginal douche at estrus	7 "	1	+	+
A10	2	2 "	Expressed C.L.	4 "	1	+	+

either ovary had functioned and found to be in estrus. She was bred and conceived. In the treatment of retained corpus luteum it is advisable to caution the caretaker to watch very closely for the slightest signs of heat. When practicable, it might be well for cows so treated to be allowed contact with a bull both morning and evening. This method might detect some cases which would otherwise be missed.

The data submitted in Table I indicate that the manual treatment of the ovary, sometimes necessarily severe, did not result in any significant injury. Of the 53 cows treated by expression of the corpus luteum, 26 produced the ovum fertilized from the ovary so treated.

That the treatment is reasonably successful is brought out by summarizing the cases treated. Out of 62 cows and heifers treated four were disposed of before the results of treatment could be determined. Of the remaining 58 cases two failed to conceive

TABLE II

Occurrence of Estrus after Treatment

No. of days after treatment

	1	2	3	4	5	6	7	8	9	10	11–21	21–31	31–41	41–51
No. of cases showing estrus		4	12	6	8	6	3	3	4		6	9	1	3
No. which conceived when bred		4	9	5	7	6	3	1	4		6	6	1	3

and 56 became pregnant, 36 from one service, 10 after two services, 8 after three services, and two after being served four times.

References

1. Albrechtsen, J., The Sterility of Cows. Alexander Eger, Chicago. Trans. by Wehrbein.

2. Theiler, A and H. H. Green. Union So. Africa, Dept. Agr. Jour. 8, 460-504, 1924.

3. Poulsen, M. Quoted in reference 1.

DO YOU REMEMBER?

1. Question. Name the parasites that cause the following: (1) African sleeping sickness of man; (2) dourine of horses; (3) gapes of poultry; (4) gid of sheep; (5) grub in the head of sheep; (6) salmon poisoning of dogs; (7) trichinosis of man, and (8) warbles of cattle.

Answer. (1) *Trypanasoma gambiensa* (a protozoon) causes African sleeping sickness and is transmitted by the tsetse fly (Glossina species); (2) dourine of horses is caused by *Trypanasoma equiperdum* (also a protozoon); (3) gapes of poultry is caused by a nematode—*Syngamus trachea;* (4) gid of sheep is caused by the larvae of a cestode - *Polycephalus multiceps;* (5) grub in the head of sheep is caused by the larvae of the sheep botfly or gadfly—*Oestrus ovis;* (6) salmon poisoning of dogs is caused indirectly by the fluke — *Nanophyetus salmineola;* (7) trichinosis of man is caused by the larvae of *Trichinella spiralis;* and (8) warbles of cattle are caused by the larvae of the flies—*Hypoderma lineata* or *Hypoderma bovis.*

2. Q. What is the largest nematode known?

A. The largest nematode so far as is known, is *Dioctophyme renale.* It is a parasite which inhabits the kidney and peritoneal cavity of carnivores. Females a meter in length have been found.

3. Q. About how much blood is ingested by a hookworm each day?

A. According to experiments on dogs with *Ancylostoma caninum,* Wells found that each individual ingested 0.84 cubic centimeters of blood daily.

4. Q. What are the scientific names of the following: (1) gizzard worm of poultry; (2) scaly leg mite of poultry; (3) lung worm of the fox; (4) common botfly of horses; (5) horn fly of cattle; (6) stomach worm of swine; (7) thornhead worm of swine; (8) Texas fever tick of cattle; (9) sheep tick; (10) ear mite of dogs; (11) scab mite of sheep; (12) brown dog tick; (13) kidney fat worm of swine; (14) depluming itch mite of poultry, and (15) the work tapeworm?

A. The scientific names of the above parasites are: (1) gizzard worm of poultry —*Acurariaspiralis;* (2) scaley leg mite of poultry—*Cnemidocoptes mutans;* (3) lung worm of the fox—*Eucoleus aerophilus;* (4) common botfly of horses—*Gastrophilus intestinalis;* (5) horn fly of cattle—*Haematobia serrata;* (6) stomach worm of swine—*Hyostrongylus rubidus;* (7) thornhead worm of swine — *Macracanthorhynclus hirudinaceus;* (8) Texas fever tick of cattle—*Margaropus annulatus;* (9) sheep tick — *Melophagus ovinus;* (10) ear mite of dogs—*Otodectes cynotis;* (11) scab mite of sheep — *Psoroptes ovis;* (12) brown dog tick—*Rhipicephalus sanguineus;* (13) kidney worm of swine—*Stephanurus dentatus;* (14) depluming tick of poultry—*Cnemidocoptes gallinae,* and (15) the pork tapeworm —*Cysticercus cellulosa,* which is the larvae of *Taenia solium.*

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Animal Food and Nutritive Requirements

By JOHN F. McKENNA,
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NO other branch of veterinary medicine is making such rapid strides as is the science of nutrition. Animal experiments, plus clinical observations, constantly reveal new facts, and point the way to improving our knowledge as veterinary dietitians. Two chief factors should govern all dietary regulations; first, the nutritive needs in health and disease. Second, the combined observations and experience of the past. Let us balance the two, for we should base the animal's diet on nutritional requirements and arrange the details according to the fundamentals, obtained from experience.

Food stuff is material capable of being added to the substance of the body, or which when absorbed in the blood stream, will prevent or reduce the wasting of the necessary elements of the organism. Food has been defined as a palatable mixture of food stuffs. The requirements of the animal organism for these nutritive substances are the organic food stuffs, water, minerals and vitamins. The combination of these elements, or their products, maintain life and produce warmth and activity in the cells. The animal needs food to replace tissue lost by wear and tear and to supply the needs of growth.

Carbohydrates, proteins, fats, water, minerals and vitamins store energy, which in large part is liberated in the body, and when these substances are broken down through oxidation to simpler chemical bodies they give to the animal organism the same amount of energy that would be liberated by similar conversion in the test tube. The energy contained in any food

The Author at Work.

stuff may be determined by measurement of the heat which it yields on combustion in a calorimeter. A calorie is simply a unit of heat, the amount of heat required to raise one gram of pure water one degree centigrade. Since the specific heat of water varies slightly at different temperatures, the average value of a calorie is taken as the amount of heat necessary to raise one gram of distilled water from 15° C. to 16° C.

The Metabolism of Starvation

Energy, which appears chiefly as heat, is derived from the food through these chemical changes which are grouped under the term "metabolism". In determining the animal's nutritive needs, basal metabolism furnishes the starting point, for except in infancy, the younger the animal the greater the proportionate metabolic rate. The animal's nutritive needs can best be understood from a study of his metabolic processes during a period when he does not receive any food; since to meet his requirements during starvation he oxidizes his own tissues.

The starving animal first draws on his stores of carbohydrates, he then burns his body fat and if he is well supplied with fat he subsists for a time almost exclusively on this and destroys only a small part of his body protein. As the animal exhausts his body fat he draws more and

more on his body protein, and when all of his fat has been consumed, he lives solely at the expense of protein. He draws on his several tissues in varying degrees, and in the reverse order of their physiological importance, taking first those organs which are of least importance and conserving almost up to the last the most vital structures. When these vital structures are at last drawn upon, death ensues.

The length of time in which an animal can live without food varies greatly. There is a recorded instance of a dog fasting 117 days. During this period his weight fell from 57 pounds to 21 pounds.

Protein

Food in the form of protein reaches the blood as amino-acid; circulating as such it is taken up by the cells. The value of protein lies in its component amino-acids, a mixture of these in pure state and proper amount will sustain life.

The animal organism is capable of synthesizing protein, however, it is well to bear in mind that, when important amino-acids are missing from the protein or mixtures of protein, such food will not serve to maintain nitrogen equilibrium, and continued loss of body protein will occur. As an example of this; gelatin lacks three amino-acids; namely, tryptopham, cystine and tyrosine. It has been shown by feeding experiments that while gelatin will supply a small amount of protein, and during protein starvation, will reduce the tissue loss to a certain extent, it will never completely prevent this loss. Where the three missing amino-acids in suitable amounts are added to gelatin, it becomes capable of preserving the nitrogen balance. In order to compensate for the wear and tear and to build new tissue the animal's body must receive from its protein food a complete supply of the proper amino-acids which are in effect the building stones of tissues.

Nitrogen Balance

When the nitrogen eliminated from the animal's body equals exactly that taken through the food supply it may be safely said that the animal is in the state of nitrogen equilibrium. When the output exceeds the intake there is a loss of protein, and the nitrogen balance is negative.

Carbohydrate Metabolism

Carbohydrates are the most rapidly utilized of all food materials. In addition to their other functions, they reduce protein metabolism. If carbohydrates are added to the diet of carnivora the amount of meat (protein) necessary is greatly reduced.

Theory of Metabolism

The following is an abbreviation of the theory of metabolism formulated by Lusk.

In each mammal there is a basal metabolism which represents the minimal heat production, with the animal at rest, eighteen hours after he has taken a mixed diet. The cells at this time are nourished by fat and carbohydrates, the supply of the latter being under the control of the liver.

This basal metabolism may be increased by food in the following ways:

1. *Amino-acid Stimulation*:—The intermediary products of protein metabolism directly stimulate the cell to increased oxidative activity, known as specific dynamic action.

2. *Fat Plethora*:—The fat coming from the gut increases metabolism by its own oxidation. The increased heat production which comes from fatty acids may be represented as a series of successive ultra-micro-explosions occurring within the cell.

3. *Carbohydrate Plethora*:—The carbohydrate coming from the intestines increases heat production. The intermediary products of carbohydrate metabolism are more readily oxidized in the body than fat, and when these are present in sufficient amount to satisfy the energy requirements of the cell, they are oxidized to the exclusion of fat. It appears that basal metabolism is increased only in the presence of a plethora of dissociated fragments of sugar. Beyond a certain point these are no longer burned, but are converted into fat and stored as such.

4. *Carbohydrate and Fat Plethora*:—Here there is a summation of effect in that

each seems to exert its own influence on the cell independently of the other.

5. *Amino-acid Stimulation and Carbohydrate and Fat Plethora*:—It would appear that all three act independently, and that food may act on the quiet resting cell through the following independent mechanisms:

(a) A mechanism which receives its stimulus from certain amino-acids.

(b) A mechanism of carbohydrate plethora which permits the metabolism of sugar up to the limits imposed by some regulation.

(c) A mechanism capable of receiving power from the oxidation of fat.

Vitamins

In the wild, normal state the animal derived his nourishment from fresh native foods such as plants and the flesh of other animals, including the internal organs of these animals that are known to be high in nutritive vitamin and mineral value. When he is made to live on purified and highly refined foods, nutritional failure results and the characteristic diseases often ensue.

In these purified diets certain essential factors are lacking. At the present time six of these important factors known as vitamins are recognized. In the old sailing vessel days, or as early as 1747, it was known scurvy could be prevented if sailors were given lemon or orange juice. This early history proved that scurvy results from the lack of a substance which lemon juice or orange juice supplies, namely, vitamin C.

A tremendous amount of experimental work has been done on the feeding of young animals on purified food stuffs, such as purified casein, starch and lard, and even when appropriate salt mixtures were added to such diets, the animals failed to grow.

Six fairly well known vitamins are recognized. Their physiological action in simple terminology may be related as follows:

The vitamin related to growth is called vitamin A; to beri beri vitamin B; to scurvy vitamin C; to rickets vitamin D; to gestation vitamin E; and to pellagra vitamin G.

Vitamin A

The sole function of vitamins in an animal's diet should not be considered as being chiefly to overcome the deficiencies referred to above. For we must remember that where there is a deficiency in vitamin A there is an increased susceptibility to infection, and this is especially evident in the eye. Vitamin A deficiency probably renders all organs less resistant to infection.

Vitamin B

This anti-neuritic vitamin is to be considered chiefly as one of preventive medicine. In addition to polyneuritis other elementary disturbances follow vitamin B deficiency. There is atrophy and congestion of the intestinal wall; this leads to endocrine imbalance. It has been shown that the lack of vitamin B results in a marked loss of appetite, whereas its subsequent administration restores the desire for food. Some investigators assume that the lack of this vitamin results in a form of nuclear starvation in which the lesser important organs are first involved, and the most important, such as the heart, and the nervous system are the last to suffer.

Vitamin C

Lack of vitamin C not only produces scurvy, but it leads also to many related atypical states of health. Where there is a deficiency in this vitamin, loss of weight, hemorrhage of the skin and joints, soreness of the joints, disease of the gums, and loss of teeth are some of the conditions which may occur. The addition of vitamin C in sufficient quantities in the diet will cause prompt subsidence of these symptoms.

Vitamin D

The question and the relation of vitamin D deficiency to rickets is not difficult to settle, for when dealing with the experimental animal, rickets and its various complications can be produced almost at will with vitamin D deficient diets; correction of this condition can be accomplished when this all important vitamin is added to the

diet. In dealing with the vitamin D deficiency consideration must be given to the calcium and phosphorus balance. Also the very condition which we aim to correct where there is a deficiency in vitamin D can be produced by over dosing with vitamin D carriers, for it has been definitely proved that rickets can be produced from toxic doses with cod-liver oil and other vitamin D carriers.

Vitamin E

Faulty or lessened fertility commonly occurs with vitamin E dietary deficiencies. So much so that reproductive capacity is now looked upon as the best criterion of an animal's nutritive state. A or B avitaminosis will in a characteristic manner interfere with reproduction, the former by producing a cornification of the vaginal epithelium, and the latter by interference with ovulation, or by the lessening of the sex interest in the male, but the sterility produced by the lack of vitamin E is essentially different, involving as it does an entirely different part of the reproductive mechanism. Sterility of the male also accompanies vitamin E deficiency. Vitamin E is related to other body functions as well.

Vitamin G

This heat resisting fraction of the vitamin B complex, the separate identity of which is now definitely determined, and the lack of which produces pellagra in man, is an all important vitamin element in the diet of animals. For when the same treatment accorded pellagra in the human is applied to dogs suffering with black tongue, results produced indicate this same type of dietary deficiency exists, and by simply adding vitamin G to the diet, in sufficient quantity, the disease is prevented. The absence of vitamin G in the diet is responsible for skin changes, and various dermatites of the deficiency order.

The effects of the deficiency of this vitamin may be summed up as loss of weight, sore eyes and mouth, paralysis, retarded growth, the various forms of skin trouble and black tongue.

Minerals

Although the analysis of the ash of animal tissue reveals the presence of calcium, phosphorus, iron, copper, potassium, magnesium, chlorine, iodine, fluorine, sulphur, lithium, barium, manganese-aluminum, and silicum, some of these are needed by the animal organism in amounts so small that a sufficient supply is ordinarily assured by the regular diet. The regular diet of animals, however, often fails to meet the requirements needed in calcium, phosphorus and iron. These are, therefore, entitled to special consideration.

Calcium

Many diets fall below a sufficient margin of safety in calcium intake. To preserve the desired equilibrium a sufficient amount of food calcium must be supplied, or the animal will be forced to draw upon its own bone and other structures.

Phosphorus

Phosphorus forms an important part of the nuclear structure of every cell and phosphorus deficiency in animals is common. The depraved appetite we frequently see is caused by the lack of this important mineral, therefore, we should bear in mind that phosphorus is an important item in the diet of animals. The ratio of phosphorus to calcium must be taken into consideration. These essential mineral elements should be supplied in a ratio of calcium 2 to phosphorus 1.

Iron

If any essential mineral element, vitamins or other type of building substances are missing, no matter how abundant the supply of iron, there can be no construction of hemoglobin, therefore, we should not depend on iron alone to secure results in animal anemias. Lean meats are rich in iron because of the hemoglobin they contain, but there is very little iron in fat.

Iodine

In certain localities iodine deficiency is readily recognized by hairlessness and goiterous conditions, particularly in the new born, and this mineral element should be given consideration in localities known to be deficient in natural sources of iodine.

Outstanding Diseases and Peculiarities of Cats

By L. H. LA FOND,
Detroit, Michigan.

The Author.

FOR a number of years, I have been reading with no little interest, veterinary literature under innumerable titles, but do not recall seeing any paper pertaining to the diseases of cats. Short articles have appeared from time to time covering a particular phase of cat trouble, but no lengthy papers in our journals, periodicals, etc., about diseases of our feline friends.

We probably know less about cats and their ailments than about any other animals met in our daily practice. I am not in a position to say why this is true, unless it is because no great amount of experimental work has been done with them. The dog makes a much more satisfactory animal for research in that he is entirely different in his behavior toward mankind.

Everyone practicing veterinary medicine knows from experience that cats have a greater number of what might be termed idiosyncrasies than dogs. For instance, morphine or even apomorphine has just the opposite effect on cats that it usually has on dogs. Also phenol or products containing phenol used externally as in the bath, etc., are almost always fatal. Too, stimulants; such as, strychnine, caffeine, and hydrastis must be given very carefully. Mercurial preparations are too dangerous for external use.

Because of a cat's nervous make-up, most veterinarians consider their successful hospitalization more difficult than that of dogs. Cats often, because of nervousness, develop a type of nostalgia or other trouble to which we give a general term of "kennelitis." One could go on and on, but it is suffice to say that in many respects the treatment and care of cats is surely different from that of dogs.

It might be said that medicine in tablet form rather than liquid is to be preferred for best medication. In the majority of instances a sugar coated tablet can be given rather easily to cats. If the head is tilted way back, the mouth opened and the tablet or tablets dropped in, they will usually slide right down the animal's throat. If the disposition of the patient should be such that the toe nails require watching, a towel or some such cloth can be thrown over the animal's body and the fore limbs held through the cloth by a second party. This makes for safe and easy medication without creating any excitement in the patient.

And now, a few remarks on the outstanding diseases and conditions in cats that we have encountered in our practice here.

Feline Influenza

This is a term of convenience for an acute contagio-infectious disease of cats of all ages, principally in young animals. This is a condition in cats which resembles symptomatically canine distemper. I feel though, that etiologically, the two diseases are entirely different. In numerous instances cats suffering from this malady have been housed with pups and dogs

apparently susceptible to distemper without their contracting it. We have also observed the opposite situation in which canines suffering from distemper were with cats in the same home or some such environment without any visible symptoms developing from this exposure in the cat or cats. They appeared to remain perfectly healthy.

The actual cause of this disease I do not know. Possibly it is a virus infection with bacterial complications such as we get in canine distemper.

The symptoms are: depression, vomiting (in the early stages), anorexia, and a high temperature. We have observed other symptoms but those mentioned are the common ones. If the respiratory system is involved, there is sneezing and a watery discharge from the nose, later becoming purulent and a cough developing about the same time. Conjunctivitis is usually present with other eye complications manifesting themselves as in canine distemper. Diarrhea often develops during the course of this disease in our experience and has proved very persistent. If the diarrhea continues, there is usually a drop in temperature; even to sub-normal. Emaciation and dehydration manifest themselves. We have never observed any nervous involvment with this disease, nor have we felt that much immunity was developed as a result of an attack.

Our prognosis is always guarded when the animal has been ill for some time before treatment is begun.

In attempting treatment on these cases, we use mixed infection serum—usually canine—in the early stages, giving from 0.5 to 1 cc per pound of body weight. The quantity depends upon the animal's condition and the severity of the attack. This is repeated at 24 to 48-hour intervals, or as warranted. The medicinal care is entirely symptomatic, keeping in mind that cats differ from dogs in their reactions to many medicaments, as mentioned earlier in this paper, and treat them accordingly.

We desire to see them housed in a clean warm place with plenty of fresh air, but no draughts. They are tempted with appetizing nutritious food; such as beef, raw or cooked, raw liver, kidney, milk or milk and cream, or cream alone, etc. Force feeding has never been practical nor successful with us.

Acute Gastritis and Gastro-Enteritis

I have grouped these conditions in cats under one head because it is almost impossible to differentiate between the two, at least during the early stages. Both are characterized by vomiting, thirst, listlessness or restlessness, anorexia, a desire to crawl away into a dark quiet place, and sometimes, but not always, sensitiveness in the abdominal region.

The etiology is very variable. The cause may be spoiled food, poison, hair, faulty feeding, foreign substances, irritating medicine externally applied and licked off, or given internally.

The diagnosis is made on the symptoms, history, no rise in temperature (feline influenza), and sudden onset.

We have no routine treatment for this trouble. If the bowels seem full, we give an enema. This is followed by a mild laxative such as magnesia in tablet form. We sometimes use a combination of magnesia, bismuth, and pepsin—equal parts—from one to two drams every two to four hours. If this is not well tolerated, we use bismuth subcarbonate in a light bland mineral oil. This is given in like doses, but more frequently.

When the stomach is "settled," we give more laxative in tablet form containing phenolphthalein, cascara, etc.; in very moderate doses depending upon the size of the cat, its age, and its physical condition. We get good results with a tablet sold under the trade name of oxiphen for large strong mature cats, and a small tablet sold under the trade name of oxilets for kittens or weakened cats. It has the same formula as the oxiphen tablet, but the amount of the ingredients is reduced. The dose we use is from two to three tablets daily,

gradually reducing the quantity as the animal improves. We often give with this a mild stimulant such as 1/500 grain of strychnine sulphate or other salt of strychnine two or three times daily.

If the bowels are empty, we start our patient off with the bismuth subcarbonate in mineral oil mixture, which is made up of one part bismuth subcarbonate and four parts oil. We give from one to two-dram doses of this combination every one to three hours. This treatment is continued until the oil begins to appear in the feces. We then change our medication to stimulants and digestives.

The food for these cases is limited to fresh raw lean beef in small quantities. Cream or cream and milk is also given sparingly. Evaporated milk is often preferred by the patient to bottled milk. Care and attention is stressed as in all cases of sickness.

Chronic Gastritis and Gastro-Enteritis

In the chronic form of gastritis or gastro-enteritis, we find a somewhat different picture. The animal is emaciated, and the coat harsh in addition to the symptoms found in the acute form. The temperature is normal or sub-normal. There is usually marked weakness.

The cause or causes are somewhat more variable in the chronic form of the trouble than in the acute. We find improper feeding, faulty housing, insufficient exercise, intestinal parasites, etc., may be playing the causative rôle.

The treatment as used here is entirely symptomatic. We attempt to remove the cause if possible. If due to diet, we correct that. If parasitism is at fault, we treat accordingly; and, so on down the line.

Our results have been satisfactory, as a whole, in treating cats suffering from gastro-enteritis. In the acute form, if treatment is started early and carried out diligently, the outcome is to our liking. With the chronic form, it is necessary to find the causative agent for removal or correction. If this can be done and the patient is not too weak, recovery should result in most instances.

Infectious Gastro-Enteritis

We occasionally encounter, usually in kittens a few months old, a peracute gastro-enteritis. This is probably an infectious type of trouble. The causative organism or organisms is not definitely known. The writer is of the opinion that we have more than one type of infection present.

The symptoms of this peracute trouble are similar to other forms of gastro-enteritis, but more pronounced. If not treated very early, death follows in a comparatively short time (twelve to twenty-four hours).

The only treatment that we have found successful has been serum—usually anti-mixed infection serum, canine or calf scour serum. We use 1cc per pound body weight. This is repeated as indicated. Medication has been of very little help to us in this type of trouble. Our treatment, though, is always symptomatic.

Traumatic Abdominal Hernia in Cats

We have had, in our practice, a few cases of abdominal hernia in cats due both to automobile injuries and to dog bites. Our results have been very unsatisfactory.

Our technique is that of shaving the hair over the area, after finding the rupture in the abdominal wall. When the animal is well under the ether anesthesia, we make a skin incision over the area. After finding the hernial material which is usually small intestines, we locate the rupture and attempt to return this mass back into the abdominal cavity. We have never found it necessary to enlarge the opening in order to do so. We suture the peritoneum and muscles with chromic cat gut and the skin with silk worm gut. Asepsis, as in any operation, is constantly kept in mind.

Too often about the time we get the intestines back in place in the abdomen or perhaps the peritoneum and muscle rup-

ture closed, our patient stops breathing. Artificial respiration, stimulants, etc., fail to help and very shortly the cat is dead.

I have mentioned our experience with this trouble in this paper primarily with the hope that other veterinarians have had better success in treating these cases than we have had, and will tell us where our method is wrong, and also give us their procedure in that we may in the future be more successful with this type of trouble. From a frank discussion of our problems we are all bound to benefit.

Fractures of the Extremities of Cats

Our treatment for reduction of fractures in the extremities of cats is not unlike those of dogs. We keep in mind though that casts tend to bother cats more than they do dogs, and do not apply them unless absolutely necessary. If the fractured ends of the bone or bones appear to be in apposition, we feel that to put a cast on will not help the patient any, but is more liable to be harmful in that it probably will "fight" the cast.

We usually just place the animal in a small enclosure where it cannot climb nor move around much. We attempt to keep the pet there about two weeks, which is the approximate time necessary for union. It will not be complete at this time, but usually sufficient to be taken home.

If a cast is necessary, we use the fluoroscope as an aid while applying same, and the x-ray for re-examination while the animal is carrying the cast. The cast is made as light as possible, but applied somewhat tighter than on dogs. Our experience has been that if this is not done, the cat may get the leg out of the cast. I must confess that we have had a few patients on which a cast could not be kept. The patient would get that leg out somehow. Perhaps Dr. E. F. Schroeder of the Angell Memorial Animal Hospital has the answer in his modified Thomas splint. I have never tried one on a cat, but shall some time.

Internal Parasites in Cats

Worm infestation in cats presents itself occasionally here in our practice. Our method is to ascertain by fecal concentration and microscopical examination, what kind of parasites are present.

We have found tapeworms, round worm and hook worm eggs in cats. None of our hospital records show whip worm infestation in cats. I see no reason why they should not manifest themselves as they do in dogs. I am satisfied that whip worms in dogs are on the increase in this area. Coccidia are also found occasionally on microscopical examination of concentrated fecal material. Our treatment for intestinal parasites in cats is the same as for dogs only the dose is reduced.

External Parasites

This condition is handled in much the same manner with cats as it is with dogs at this establishment. We avoid the use of drugs that are not well tolerated by cats, as mentioned earlier in this paper. I might say that mineral oil makes a good safe external treatment for certain forms of dermatoses. In mange, our treatment of choice is sulphur incorporated in a petrolatum base. Either of these products have always been absolutely safe in our hands. We have found that with persistent care and attention, and repeated treatments of the above products, an obstinate case of skin trouble will respond to treatment. I believe that a good tonic used in conjunction with either of these medications is helpful.

We use an insecticide powder having derris root as the active ingredient for fleas and lice. This is applied every three or four days and well rubbed in each time. I mention this because one mistake that is too frequently made is that the powder is not next to the skin, and naturally the results are not satisfactory. When bathing is necessary, we have found Cooper's dog shampoo a very safe and satisfactory preparation to use. We use the mixture about one-half as strong as is recommended for dogs.

During the past two years, dog ticks have constituted a nuisance in this locality. But I am glad to say, we have found none on cats, as yet. I hope that they may continue to be free of this obstinate parasite.

We have done no blood picture work on cats and only one urinalysis. This patient had pyelonephritis and cystitis. No treatment was attempted. The animal was humanely dispatched. Our results from this type of laboratory work has been very gratifying in dogs, and I see no reason why a like result should not be realized from cats. We hope to be able to use the blood count and the urinalysis on these obstinate cases in cats more often in the future than we have in the past.

Wounds

Wounds and abrasions in cats are treated with mercurochrome (2%) or scarlet oil. We do not like iodine, or other alcoholic medications because of their irritating and possible toxic effects. Suturing of skin wounds is practiced very little. We possibly could and should suture more than we do. But, we have found that healing takes place usually in a comparatively short time when treated as an open wound, and being the easiest method for all concerned, perhaps too often follow it.

THERE are of course a number of other angles to feline practice than those touched upon. But, if I have created a desire among veterinarians to discuss this phase of veterinary practice at future national, state, or local association meetings, or perhaps better still, cause papers to be written for presentation at our veterinary meetings or in our veterinary publications, or both, I will feel my efforts have not been for naught. Feline practice, if cultivated, affords an opportunity for an increased income in almost all small animal practices. In this way a very few veterinarians have increased their practices largely. There seems no question that it can be done in most practices.

Distemper Vaccination

By A. R. THEOBALD,
Cincinnati, Ohio

The Author.

TODAY to be modern the veterinarian must accept canine distemper as an entity with characteristic symptoms differing very much from those he once termed canine distemper. He must actually recognize the syndrome associated with the virus in order to say a dog has canine distemper. Occasionally he finds an observing owner who can aid him in establishing the probable presence of virus in a case presented that exhibits symptoms of bacterial infection. The owner, however, is not particularly interested in differential diagnosis. To him distemper is distemper, and he cannot always see how we differentiate distemper from bacterial infection, hookworm, etc.

It would seem to me, in the light of our present knowledge and products available, that to produce active immunity we should, before engaging in wholesale vaccination against distemper, first re-educate our clients as to their understanding of canine distemper. Through extensive writings on distemper researches in the last decade few veterinarians are uninformed,—at least, few should be uninformed.

The owner's attitude and knowledge are highly important. If he does not understand completely what you are doing when you vaccinate his dog, he certainly will lose confidence in you should something untoward happen. It is then too late to do the explaining.

Among the principal things clients should know are the following:

1. That canine distemper is a virus disease which lowers resistance to a point at which bacteria normally present in the dog

overwhelm him and produce what people usually call distemper.

2. That ordinarily dogs have little resistance to virus but a great deal of resistance to ordinary bacteria, else they would be getting colds every time they stepped out of doors in the winter.

3. That contact with virulent bacteria, irrespective of virus, may produce so-called distemper, but that virus in the majority of the cases is the real irritating offender.

4. That you can vaccinate effectively against virus of canine distemper and not very effectively against bacterial infections.

5. That you can select for active immunity only dogs of at least three months of age, reasonably free of internal parasites, and in good physical condition and good resistance.

6. That they cannot depend entirely on biologics. They must furnish a balanced diet with heavy vitamin content, sunshine and proper exercise.

7. That once virus is given they are to isolate the dog for a month, keep him rested, and to understand that the dog is actually sick, even though they cannot recognize it. No baths are to be given.

8. That they are to take temperatures twice daily for a period of a month, and return the dog immediately if high temperature is found to last longer than a day, or if visible symptoms of sickness are present without temperature.

9. That their failure to carry out their part may mean a severe, complicating case of so-called distemper.

10. That any additional treatments or serums are to be paid by them.

11. That regardless how carefully you and they observe all rules, in some dogs distemper immunization gets beyond control —this usually due to severe bacterial reactions, but may be due to excessive virus reaction.

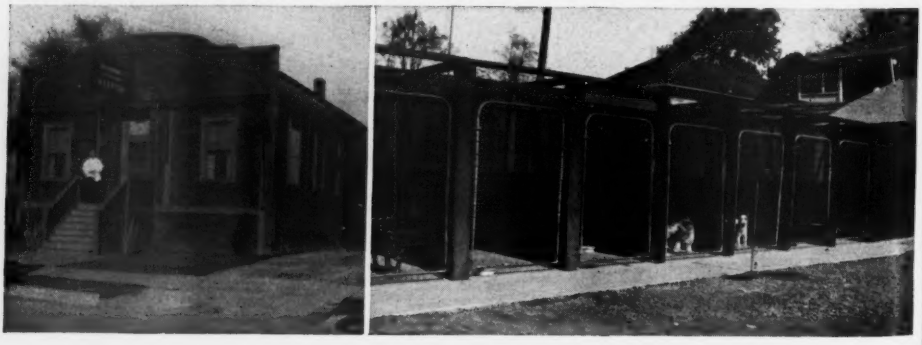
12. That you, as a veterinarian, cannot say no dog will die incident to the immunizing process.

Any attempt to take these things lightly will sooner or later bring grief to the veterinarian. In addition he may lose the respect and confidence of pet owners.

In my experience with distemper vaccination, using virus, I find in not a few cases I talk myself out of the work. I often wonder how much trouble I have been saved, for many times I am not quite confident that those having distemper vaccination done really understand.

This business of using live virus in a pet practice is vastly different from its use in large groups of dogs, as for instance, in Admiral Byrd's pack of huskies, or in medical centers. Here a loss of a few dogs means nothing as compared with losses sustained without distemper vaccination.

There is a taint of commercialism in all of us and an incentive to sell distemper vaccination. The fault of the matter is we should let the merits of distemper vaccines sell themselves, only to properly informed clients.



Amebic Dysentery in Dogs

By R. T. McLEAN,
Ambassador Dog & Cat Hospital,
Los Angeles, California

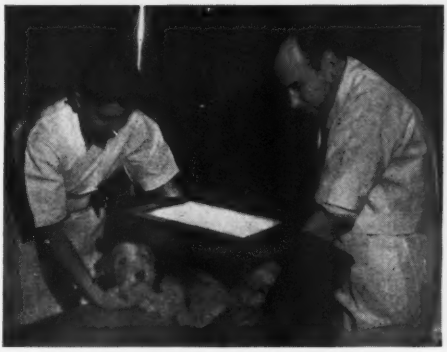
HERETOFORE the occurrence of pathogenic ameba as the causative factor of a hemorrhagic enteritis in dogs was of little importance, but with the increasing number of human cases of amebiasis in the United States, there is a possibility that the disease will become more prevalent in the dog, as the *Endameba histolytica* of man is pathogenic for dogs.

The clinical symptoms of amebic dysentery are almost identical with those of the bacillary type, and coccidioses. On palpation the abdomen is tense and the animal evidences pain. The temperature is slightly elevated in the early stages (102-103° F.) but drops to normal or below as the disease progresses. Marked debility is noted in chronic cases. The appetite is not affected to any great extent. The stool is loose and consists chiefly of blood and mucous. Defecation is accompanied by tenesmus.

Positive diagnosis can be made only by a microscopic examination of the fecal material, finding the trophozoites (motile stage) or the cysts and differentiating *E. histolytica* from the nonpathogenic species of ameba.

SEVERAL non-pathogenic species of ameba inhabit the intestinal tract of man, the most common of which is *Endameba coli*. *E. coli* has been found in dogs, but never in a pathogenic rôle.

It is highly important that the fecal specimen for examination be a freshly voided one. If blood and mucous are present in the dejecta, a small flake of mucous or blood may be placed on a glass slide and emulsified with a drop of normal saline solution. A cover slip should be placed over the material and the slide should be examined immediately, first under low power and later under the oil immersion lense, if suspected objects are sighted. The light should be cut down greatly as the trophozoites are very transparent.



Left: Dr. R. L. McLean. Right: Dr. T. G. Beard. Fluoroscope examination, Ambassador Dog & Cat Hospital.

If no amebae are found by the above method and amebic dysentery is still suspected the fecal material may be centrifuged in order to concentrate the protozoa.

Several methods of concentrating ameba cysts are available. However, the Shearer method is probably the most practical. The Shearer method is as follows:

1. Liquify one gram of fecal material in water.
2. Fill a centrifuge tube half full with liquified material and add an equal quantity of saturated sugar solution.
3. Mix well and centrifuge three to four minutes at a moderate speed.
4. Remove top layer from centrifuge tube with wire loop and examine under oil immersion.

Endameba hystolytica has three stages in its life cycle, trophozoite, precystic, and cystic.

THE unstained trophozoite is difficult to distinguish from the surrounding material unless in motion. The nearly transparent ectoplasm in the moving individual pushes out and the endoplasm which is coarsely granular flows into the pseudopodia formed by the ectoplasm. The endoplasm which gives a ground glass appearance contains the nucleus and injested material. Injested red blood cells may be seen in the endoplasm of *E. histolytica* but not in the non-pathogenic species of ameba.

The observation of erythrocytes in the trophozoites is, therefore, diagnostic of *E. Histolytica.*

The precystic stage of *E. Histolytica* and *E. coli* are practically indistinguishable as the trophozoite of *E. histolytica* rids itself of all ingested material including the erythrocytes. Progressive motility is absent but pseudopodia may be thrust out and quickly retracted.

To bring out the detailed structure of the ameba, staining with iron hematoxylin is employed.

Mallory's method is as follows:

1. Make a thin smear of fecal material on a cover slip.
2. Immerse in a sublimate alcohol solution.
   (a) Saturated bichloride of mercury in physiological salt solution 30 parts.
   (b) Methyl alcohol two parts.
   (c) Glacial acetic acid two parts.
3. Soak in ethyl alcohol ten minutes to remove the mercury.
4. While still moist apply a 10% solution of ferric chloride three to five minutes.
5. Drain away the excess and stain three to five minutes with hematoxylin solution.
   (a) Dissolve the five grams of iron hematoxylin in 4cc to 5cc of water with heat.
6. Dehydrate with ethyl alcohol.
7. Dip rapidly into xylol.
8. Allow to dry and examine under oil immersion.

THE properly stained cysts of *E. histolytica* are of great diagnostic importance. The cytoplasm takes a gray color, the wall is unstained and the nuclei are black. The shape is round to oval. The cysts contain one, two or four nuclei, the mature cysts having the four nuclei. Instances where more nuclei occur in the cysts of *E. hystolytica* are infrequent.

Endameba coli cysts have one to eight nuclei.

Summary

If upon examination of a fresh unstained fecal specimen the veterinarian finds an ameba which is progressively motile and contains red blood corpuscles; and upon examination of stained preparation he observes cysts with one to four nuclei; and the animal from which the ameba is taken is affected with a bloody, mucoid diarrhea, then the diagnosis of amebic dysentery is justified.

Treatment

Emetin given intravenously is considered a specific by some clinicians in the medical profession. However, emetin is highly toxic to dogs and must be given with care.

Vioform (Ciba) which is a quinine derivative given in two grain doses b. i. d. to a 20-pound dog was found very effective and no toxic effects were noticed.

Case Reports

A wire-haired terrier was presented to us with the history that the owner of the dog had been under irregular treatment for ameba dysentery for the past fourteen years.

The terrier had been subjected to an examination at a laboratory in another city. The result of the examination showed that the animal had ameba infestation. The treatment which had been started a few weeks prior to the time we saw the animal consisted of subcutaneous injections of 1/5 grain emetin. We understand these injections were given about every third day; following the third injection the dog started to lose weight and inappetance occurred.

McCLELLAND VETERINARY HOSPITAL, BUFFALO, N. Y.

The treatment with emetin was there-

fore discontinued, with the hope that the appetite would return. The diarrhea, which had been checked to some extent while the animal was under the emetin treatment, again became severe.

At the time we made the examination a second dog from the same owner was also presented to us. Fecal examination showed both animals heavily infested with *E. histolytica*. *E. coli* were present also, as were some unidentified ameba. The temperature of both animals was slightly elevated and on palpation of the abdominal wall the dogs gave evidence of pain.

Treatment:—Our selection for treatment was Vioform (Ciba) which is a quinine derivative and is much less toxic than emetin. We understand that Vioform has been used in human medicine in the treatment of ameba with good result. Our doses were two grains Vioform in capsules per os, twice daily for a period of ten days.

Results:—On the third day after treatment was started, a microscopic examination of the fecal matter revealed *E. histolytica* and *E. coli* in both dogs. The feces were nearly normal in consistency and there was no blood and very little mucous.

On the seventh day microscopic examination was negative for ameba in the female. In the male, however, examination showed ameba though in diminished numbers.

On the tenth day microscopic examinations were negative in both animals.

During the course of treatment both dogs had good appetites and gained weight, and their temperatures were practically normal.

Several subsequent examinations, varying from three weeks from time of treatment, until nearly a year afterwards were negative for ameba.

Summary:—Two wire haired terriers suffering from ameba dysentery were treated successfully with Vioform (Ciba) with no toxic effects during the treatment, and there has been no reoccurrence of the disease in a year that has elapsed since a positive diagnosis was established.

Veterinary Service and Rural Public Health*

NO better recognition of the importance of the veterinarian in the public health program can be cited than is found in New Jersey's requirement. New Jersey requires that one member of the Department of Health shall be a veterinarian, and as far as is known, it is the only state having such a law. The New Jersey law reads as follows:

> The Department of Health is hereby established, and the same shall be governed by a board of eleven members, to be known as the Department of Health of the State of New Jersey. Not more than six of the members of the board shall be members of the same political party, and all of said members shall be residents of this State, and two of the members of said board shall be workmen. At least three of the members shall be physicians, *at least one a veterinarian*, at least one a dentist, and at least two sanitary engineers.

IN the opinion of the author one of the most significant steps ever taken to enlist the services of the local veterinary practitioners in a rural public health program was that by the W. K. Kellogg Foundation when a request was made of the Division of Veterinary Science of Michigan State College to conduct a short course for veterinarians in milk and meat inspection. All of the veterinarians of the seven counties benefitting by W .K. Kellogg Foundation' aid and veterinarians in adjoining counties who practice in the seven counties were invited to attend this short course as the guests of the Foundation. The author wishes to testify to the part played by Leonard M. Board, Sanitary Engineer of Hillsdale County and his own colleague Dr. B. J. Killham, Extension Specialist in Animal Pathology, They have cooperated in making the arrangements.

This short course represents the launching of a sincere effort to include the practicing veterinarian in a comprehensive community health project. The veterinarian's place in this participating program

* Excerpts from a paper presented at the Annual Meeting of the American Public Health Association, Milwaukee, October 7-10, 1935.

is apparent, and it presents a challenging, worthwhile task. The Community Health Projects can be made a better project through the interest, preparation and cooperation of the veterinary practitioner.

The program arranged is as follows:

Monday, October 28, 1935

Registration and Introductory Remarks—Ward Giltner.

Meat Inspection in the United States—Representative of Fed. B. A. I.

Problems of a Municipal Meat Inspector—H. S. Atkins, E. E. Hamann, R. E. Hammond.

Location, Construction, Equipment and Management of Slaughter Houses—C. H. Clark.

Tuesday, October 29, 1935

Brucella Infection of the Udder—I. F. Huddleson.

Problems Encountered in Milk Inspection—E. J. McLachlan.

Milk Inspection and Public Health—W. H. Haskell.

Infectious Diseases Important in Meat Inspection—B. J. Killham.

Parasitic Diseases Important in Meat Inspection—L. B. Sholl.

Slaughter Procedures and Technique of Meat Inspection—C. F. Clark.

Wednesday, October 30, 1935

H. K. Gidley, in Charge

Methylene Blue Reduction Test and Standard Plate Count of Milk—E. D. Devereux.

Milk Ordinances—F. W. Fabian.

Dairy Farm Inspection—Russell Palmer.

B. J. Killham, in Charge

Adulteration and the Use of Preservatives in Meat Products—D. R. Coburn.

Discussion of Veterinarian's Participation in Community Health Project.

Laboratory Study of Lymphatics Important in Meat Inspection—C. F. Clark.

Thursday, October 31, 1935

Infectious Mastitis—C. S. Bryan.

The Department of Agriculture and Milk Inspector—James Warner.

Laboratory Demonstration of Standard Plate Count and Methylene Blue Reduction Test—E. D. Devereux.

Inspection and Use of Meat Products and By-products—C. F. Clark.

Methods of Curing and Preserving Meat—G. A. Brown.

Study of Pathological Museum Specimen—E. T. Hallman.

Friday, November 1, 1935

Direct Microscopic Count of Milk—C. S. Bryan.

How to Bring About the Production of Better Milk—E. F. Meyer.

Laboratory Diagnosis of Streptococcic Mastitis—C. S. Bryan.

Applied Meat Inspection, Rosevale Packing Company, DeWitt, Mich.—J. H. Campbell.

Saturday, November 2, 1935

Physical Examination of the Udder—G. E. Taylor.

Laboratory Demonstration of Direct Microscopic Examination of Milk—C. S. Bryan, E. D. Devereux.

Everyone who is interested in a complete program of public health, especially for rural communities, will be interested in the outcome of this undertaking. The author promises to keep the public informed.

WARD GILTNER.

East Lansing, Mich.

IOWA DISEASE REPORTS

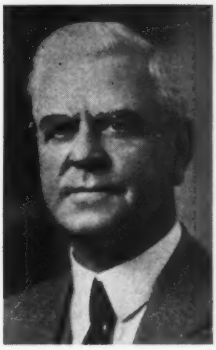
Swine pox outbreaks have been reported by several veterinary practitioners during the past two weeks. The disease is caused by a filterable virus similar to smallpox of human beings, but swine pox is not transmissable to man. Swine pox is identified by buckshot-sized pimples or pock marks on the skin of the pig around the ears, face, and under surfaces of the body. These hard, round nodules fester and become coated with dirt so that they resemble black beads. Often, the skin is very red. Sows may show extensive pox lesions on the udders. Hog cholera is a common complication in pigs which are devitalized by swine pox. Any suspicious trouble of this nature should be immediately reported to the nearest veterinarian as it may easily become a neighborhood menace.

The feeding of new corn is given as the cause of numerous losses among swine at this season. New corn seems difficult to digest and animals fed heavily on new corn are believed to lose their resistance to infections.

Flu in swine is becoming prevalent and where hog cholera has become a complication, heavy death losses have resulted. Flu in cholera-susceptible hogs weakens the animals and makes them more liable to contract hog cholera.—*Eastern Iowa Veterinary Association Press Bulletin.*

The Terminology Used in Canine Distemper Prophylaxis and Treatment

By O. A. LONGLEY,
San Francisco, Calif.



The Author.

DURING the past decade biological therapy, or, if you choose, the use of biological products for prevention and treatment, has undergone many developments, both of products and methods of application. The introduction of various products similar in character but designed to effect different results has brought words into use that are not always as correctly employed as they should be if we desire to avoid misleading infelicities. The intention is to point out particularly some of the words commonly misused in discussing the biological products now employed in the prophylaxis and treatment of canine distemper. Among them are:

Homologous : Heterologous
Antigen : Virus
Vaccine : Bacterin
Vaccinate : Inoculate

Each of these words has a definite meaning and confusion arises when improperly used. What is the proper and improper use of the pairs indicated above?

Homologous (Gr. assenting or agreeing; homo, same + logos, relation) sprang into current use in canine medicine when homologous anti-canine-distemper serum was discovered. The word is an ordinary one and is exactly correct when used to define that particular type of serum. However, many of us at that time had not added the word to our vocabularies and some of us older ones did not at first realize its exact meaning.

The two outstanding examples of homologous serum commonly used in modern veterinary medicine are homologous anti-canine-distemper serum and anti-hog-cholera serum. Both of these serums are produced from animals of the species in which they are to be used. Both are homologous when so used but are heterologous when injected into species other than the ones from which they are obtained.

The reason "homologous" became so closely associated with anti-canine-distemper serum is that only heterologous serums were employed in the treatment of that disease until the homologous anti-canine-distemper serum was introduced for general use. The old anti-canine-distemper serums were heterologous but were not so named. They were submerged when the homologous serum became available. Later, however, when the complex nature of canine distemper infection was realized, a persistent demand developed for an antiserum effective against the secondary infections. In view of this fact, the need of distinguishing between the two products became apparent.

The original anti-canine-distemper serum was heterologous (equine) but was not so designated. When an homologous anti-canine-distemper serum was produced it had to be distinguished from the other by the distinguishing word "homologous."

Then came along the demand for the so-called mixed infection canine serums which, being heterologous, had to be distinguished from the homologous anti-canine-distemper serum. The word heterologous (Gr. heteros, different + logos, relation) therefore, became more widely used.

Recent advancements in the production of homologous anti-canine-distemper serum have developed a potent serum much better than the original homologous serums. The modern product is polyvalent. Present day

anti-canine-distemper serum, for example, is homologous for dogs and heterologous for foxes; likewise, anti-hog-cholera serum is homologous for hogs (the same species from which it is derived), but heterologous for dogs, (not the species from which the serum is derived). Tetanus antitoxin, which is produced from the equine species, is homologous for horses but heterologous for man. The terms refer to the species in which they are used, not to the process of production.

Antigen : *Virus.* Let us consider these two terms, not so much their usage to designate certain products but more particularly to show the use (or misuse) of them. An antigen is any substance, which when introduced into the animal organism, causes the production of an antibody. Virus is a collective term for minute living organisms. Not all antigens are viruses and viruses are antigens only within certain limitations. Antigens can be anything from extracts of common foods to the "hottest" kind of live virus or suspensions of virulent pathogenic organisms. An antigen may be antigenic when injected into a hyperimmune animal but not when injected into a nonimmune animal, yet it may be the same virulent culture in either instance. Moreover, an antigen can be either a dead virus incapable of doing harm, or an active viable virus capable of producing disease. Killed canine distemper virus can be injected into susceptible dogs without injury. As such it is an antigen. Live virus can be injected into dogs that have been or are being immunized with serum and also be an antigen. If live virus is injected into a nonimmune dog, it becomes a "pathogen." It is clear, therefore, that the word "antigen" designating two distinctly different canine distemper products would not be proper unless defined as a "killed suspension" or a "live virus," etc. The so-called canine distemper tissue vaccines are antigens as is also the live virus used with anti-canine-distemper serum in the simultaneous method of immunization. The word is correct in both instances if properly qualified.

Reference herein pertains to the use of these words in conversation or writing; not to their use on labeled products because all labels are worded to meet approval of the government, certain departments of which supervise such matters to prevent, as far as possible, the improper use of the conflicting terms.

The foregoing relates mainly to therapeutic antigens. The word "antigen" has a different meaning in diagnostic procedure. Some medical lexicographers devote considerable space to the definition of this word, mentioning the numerous products classified as antigens. When referring to one of the several therapeutic biological agents designated as an "antigen," the character of the product is clarified by qualifying words. For example, at least one of the canine distemper tissue vaccines is designated as an antigen and at least one of the canine distemper live virus products is sold as an antigen. In each instance, the label clearly shows just what the vial contains, what effect it is intended to produce, and just how it is to be used, but one frequently finds the word "antigen" used without any designating adjective. In some instances, the word "antigen" is used to designate biological products commonly used in canine distemper immunization, in others to designate vegetable and food extracts for allergic work; also for several products used in diagnosis. Each one may be correct. In the therapeutic field, an antigen is an agent that will confer immunity to infection or a tolerance to certain protein substances. Specific terms are necessary for the sake of clarity whenever the words "virus" or "antigen" are used.

Vaccine : *Bacterin.* These two words as commonly used interchangeably are confusing if not qualified. The word "bacterin" designates a suspension of killed bacteria. It does not have the wide variety of usages so common to some of the other words in question. Confusion does occur, however, from the common practice of calling a bacterin a vaccine. In the broader sense, bacterins can be correctly called vaccines but all vaccines are not bacterins.

Suspensions of killed organisms are sometimes designated as bacterins and by others as bacterial vaccines. In that event the adjective "bacterial" prevents confusion.

Originally (about 150 years ago) "vaccine" applied only to smallpox antigen. During the past fifty years, the word has been given broader meaning in immunology. It is now used for almost all products whereby specific resistance to infection is induced or attempted by the use of biological products. That is to the modified and attenuated virus of any disease, incapable of producing a severe infection, but affording protection against the unmodified virus. In the veterinary field, "vaccine" is loosely used to refer to such products as serum and virus, killed virus, killed suspensions of microorganisms, aggressins, toxins, attenuated cultures, serums, anti-toxins and perhaps other biological products. Modern terminology does not ban them because the word "vaccination" now means any process by which active immunity to specific infection can be raised, regardless of the character of the product used to accomplish that end. Yet, when one now speaks of vaccine or vaccination, it is necessary to indicate the kind to which one refers.

Vaccinate : *Inoculate.* This is another pair of words frequently misused interchangeably. Vaccination can be an inoculation if the organisms contained in the product used are virulent enough or the recipient's resistance low enough to produce the specific disease concerned. Inoculated means very nearly the same as infected. Some forms of vaccination can be termed inoculations (those in which live or attenuated cultures are used) but injections of killed organisms, toxins, aggressins or serums cannot be rightfully termed inoculations. Vaccination signifies the application or injection of a product intended to confer active immunity by reactions within the recipient's body, whereas inoculation refers more to an artificial infection induced with the expectation of producing a specific disease. One can convey a clear meaning of the word "inoculate" by qualifying it as

experimental, artificial, accidental, etc. The phrase "protective inoculation" conveys the same meaning as does the word "vaccination" but the two words, "vaccinate" and "inoculate," used singly and unqualified are not synonymous. For instance, to say, "I gave the dog a distemper inoculation" can have two meanings; either the dog was given live virus with the object of infecting him with distemper (the usual meaning) or a protective distemper vaccination was used to confer an active immunity to the disease (rather a strained use).

Probably the most erroneous use of the word "inoculation" is in conjunction with injections of antitoxins or anti-serums. Such injections are in no sense inoculations. They may, however, be stretched to apply to vaccinations but the tenuity is extreme. Regrettably some authors so classify them. The induction of passive immunity is not vaccination.

The object of this discussion is to clarify the use of words now causing some confusion and misunderstandings in exchanging thoughts on immunology and biological therapeutics. The careless use of these words will not uplift the status of veterinary medicine.

Laying Mashes Not Suitable for Dog Food

By JOHN W. PATTON,
East Lansing, Michigan

APPLICATION to various agricultural experiment stations, equipped for research in animal nutrition, has resulted uniformly in the reply that Federal funds supplied the stations for "Research into physiology and diseases of farm animals and for the publication and distribution of the reports of such research," cannot be used for research into the nutritional requirements for the dog, for the reason that the Secretary of the U. S. Department of Agriculture, who has charge of the allotment of the funds, has ruled that the dog is not a "farm animal" within the meaning of the law. The Alabama station at Auburn, however, has found a way around this restriction on the use of public funds. It has published, recently, Leaflet No. 13 on "Dog Feeding Suggestions," by D. W. Salmon, Research Professor of Animal Nutrition. While obviously the publication does not represent research, there is cost entailed in its publication and distribution. Whether or not it represents an unauthorized use of public funds is not a concern of this writer. What does interest him, is the waste of funds that might have been used for the much-needed purpose of research in basic nutrition, the misinformation that is distributed, the inevitable harm that must result, and the injustice to the dog, an animal deserving of food better adapted to his needs than a poultry mash; for that is what the "Auburn Dog Ration" is.

In the opening paragraph of Leaflet No. 13, we find:

"In feeding dogs, one should keep in mind the following points: the ration should be palatable; it should contain enough protein, minerals and vitamins; it should be sufficiently concentrated to provide enough energy without overloading the digestive system, but at the same time it should have sufficient bulk to prevent constipation; and finally, it should be economical to feed."

The foregoing are some of the cardinal principles of general feeding taught at Cornell when I was a student there, 20 years ago. They were sound then; they are sound today, and had not Professor Salmon forgotten them as soon as he set them down, he might have devised a far better formula. Let us examine his formula and see by what a wide margin it misses the cardinal principles set out in the foregoing paragraph:

The Auburn Home-mixed Dog Ration

	Lbs.
Yellow corn meal	350
Wheat bran	100
Wheat middlings	200
Meat scraps (55-60% protein)	100
Fish meal (55-60% protein)	100
Skim milk powder or dried butter milk	100
Alfalfa meal or alfalfa leaf meal	20
Bone meal	20
Salt	10
	1,000

1. *Palatability.*—This should not require discussion. The leaflet states that the Auburn ration may be fed dry (raw). No one "knowing" dogs will be able to think of a less palatable ration for dogs, much short of wheat straw and sun-flower silage. Professor Salmon probably bases his claims for palatability upon the evidence that dogs have eaten it. Anyone familiar with dogs in Alabama (and not in Alabama alone) knows that a large percentage of them are maintained on the borderline of starvation, and under such conditions, man or beast tempers his sense of taste in the fire of necessity. This writer gathers from the report, that Professor Salmon had some difficulty in getting "spoiled" or "pampered" dogs to eat his ration, for he states: "Dogs that have been spoiled by pampering sometimes refuse the ration at first, but they may usually be trained to it by proper methods of feeding." And again: "If they are not given other food they will eat enough of this ration to keep in good condition."

Thus it would appear that this ration for dogs leaves something to be desired in palatability. This is obvious because of the high percentage of uncooked cereals which it contains. The dogs referred to as being spoiled by pampering were quite likely animals the diet of which was given some consideration, and not those forced by necessity to raid the chicken coop for sustenance. Supplemented, as routinely it would be, with a few table scraps, an occasional mouse, a few crickets, grasshoppers, grubs and earthworms and from time to time a carcass of some farm animal, a dog doubtless can be maintained on this ration; but is that any reason for so abusing him. For use or companionship something more than bare maintenance is desirable, not to mention the needs for growth, reproduction and lactation.

2. *Adequate Proteins, Vitamins and Minerals.*—Accepting, with reservations, the mineral content as being satisfactory and deferring discussion of vitamins for later consideration, let us examine the proteins. The Auburn Home-Mixed Dog Ration contains 21.46% protein. This amount should be adequate; but is it when we consider the derivation of the proteins? If recent nutritional research has shown anything—and it has revealed much—it has emphasized the differing values of proteins from different sources for herbivorous and carnivorous animals. In this ration, the protein is derived as follows: Cornmeal, 2.6%; bran, 1:5%; skim milk, 3.6%; wheat middlings, 2%; meat scrap, 5.5%; fish meal, 5.5%; alfalfa, 0.31% and bone meal, 0.45%.

Professor Salmon apparently recognized the inadequacy of his cereal proteins and has added the meat scrap for the protein it contains. Well, we shall say that apparently he does not know his meat scrap. This subject has been discussed at length in these pages and readers are familiar with it, if Professor Salmon is not.

3. *It Should Be Sufficiently Concentrated to Provide Enough Energy Without Overburdening the Digestive System.*—This is important in all feeds, but especially in dog food; since this animal has a simple digestive tract, of relatively small capacity, in which the sojourn of food is short. How, by any stretch of the imagination, can raw cornmeal, bran, wheat middlings and alfalfa —67% of the Auburn ration—be regarded a concentrated food for a dog? It is not concentrated even for poultry. It contains but 1382 calories per pound, which is low for a dry dog food, and that in a form which is highly indigestible for a dog, although readily digestible for chickens. This writer would advance the opinion that the Auburn Home-Mixed Dog Ration has a coefficient of digestibility far below the average commercial dog food and that it does not provide adequate energy without overburdening the digestive system of the dog.

4. *It Should Have Sufficient Bulk to Prevent Constipation.*—In this respect the Auburn ration is poorly formulated for the good reason that it is difficult to compound a dog food which contains in any considerable measure, the so-called carbohydrate feedstuffs and not exceed the recognized tolerance of dogs for fiber. The problem, therefore, in preparing dog food formulas is to keep the bulk as low as possible and still to be confronted with the food-stimulated evacuation. To emphasize "bulk" in a dog food reveals a lack of appreciation of canine nutritional physiology as well as a practical knowledge of dog feeding.

5. *It Should Be Economical To Feed.*—What is meant? Economical to buy, to use or just plain cheap by the pound? The Auburn ration qualifies only as to the latter —and not outstandingly in that respect. At a cost of 1/5 cent more per pound for ingredients than the Auburn ration costs, dog foods can be and are formulated which are adequate and highly digestible. It is, therefore, poor economy to feed to a dog any such ration as the one Professor Salmon advocates.

IT WOULD thus appear that the Auburn Home-Mixed Dog Ration fails to satisfy most of the cardinal principles of feeding which the originator of the ration has accepted as sound.

It is interesting to observe the genesis of the revolutionary system by which the dogs of Alabama and elsewhere are to be adequately nourished on a palatable, concentrated, efficient, laxative and yet economical basis. A few quotations from the discussion in Leaflet No. 13, throw light on its origin:

"In response to a demand for a feed that would be better adapted to the needs of the dog than is the usual poultry laying mash, the following ration has been developed at this station."

And again:

"If several dogs are kept it will be necessary to supply other feed in addition to the kitchen scraps. Perhaps the simplest thing to do in such cases is to feed the same mash mixture which is used for laying hens. *Any high-quality laying mash should give fairly satisfactory results.* The amounts and methods of feeding the laying mash should be the same as described later for the Auburn Dog Ration.—Italics mine.

This removes any doubt that we are dealing with a chicken mash when we use this dog ration. But let us see how a standard mash for chickens and the Auburn Home-Mixed Dog Ration compare:

Michigan State Formula (For Poultry) Lbs.		Alabama Polytechnic Formula (For Dogs) Lbs.
36	Yellow corn meal	35
20	Bran	10
20	Ground oat meal	....
....	Middling	20
10	Skim milk (Powdered)	10
5	Meat scrap	10
5	Alfalfa meal	2
2	Bone meal	2
1	Salt	1
1	Cod liver oil	....
....	Fish meal	10
100	Total	100

There are but two essential differences in these poultry and dog formulae—more meat scrap in the latter and an attempt to supply vitamins with fish meal, instead of cod liver oil.

While Professor Salmon gives first place to feeding the Auburn dog ration dry, he states that it may be moistened with water, skim milk or buttermilk and fed raw, or it may be cooked. However, we are told, "cooking is unnecessary and adds to the expense and trouble of feeding." These directions, particularly for cooking and adding milk, recall a farmer, somewhat of a wag, who announced at a Farmers Institute that he had discovered that sawdust constituted an excellent ration for laying hens. Asked how he induced them to eat it, he replied, by mixing wheat with it. Upon inquiry as to how much wheat to use, his answer was: "The more, the better."

As a final admonition to users and to further certify to the completeness of the Auburn Home-Mixed Dog Ration, we are told:

"Its cost could be increased by the addition of liver, yeast, cod liver oil, eggs, fancy kinds of cereals or enzymes of uncertain or questionable value. There is no convincing evidence that the ration would be improved by such additions."

The statement that such a ration would not be improved by liver, eggs, yeast and cod liver oil is in line with saying its nutritive value for a dog would not be lowered by adding 10 bales of good prairie hay and a few forkfuls of No. 2 light clover and timothy mixed. To imply that enzymes would not facilitate the utilization by the dog of ingredients such as are found in the Auburn ration, is to imply a complete lack of uptodate information on the subject of digestion in the dog.

Drugs Used in Veterinary Medicine

By VICTOR LEWITUS, Ph.G., B.S., M.A.,
Instructor in Materia Medica, Columbia University College of Pharmacy,
Associate Professor of Materia Medica, First Institute of Podiatry, New York

X. JABORANDI—The Source of Pilocarpine

History.—Pilocarpus or Jaborandi, as it is more commonly called in its native home, is a relatively recent acquisition to materia medica. It appears to have been mentioned first by the Dutch investigator Piso in conjunction with some preparation of Ipecac in 1643. Fifty years later (1693) the French explorer, Plumier, described two species of Jaborandi. Lemaire made some further studies of a botanical nature in 1854, but its actual introduction into modern medicine did not occur until 1874. At this time a Brazilian physician, Dr. Coutinho, after observing its use by the natives for a long period, brought its sialagogue properties, to the attention of the world. After this discovery, the market was flooded with spurious species of "Jaborandi" so that even plants of distantly related families were the source of worthless crude materials. The European authority, Holmes, and the American authority on the subject, Rusby, both contributed considerable information to clearing up a moot question. Until recently, the crude drug in the form of leaflets was official in the U.S.P., but because of the widespread substitution and difficulty of regulation, only the alkaloidal salts are now officially recognized.

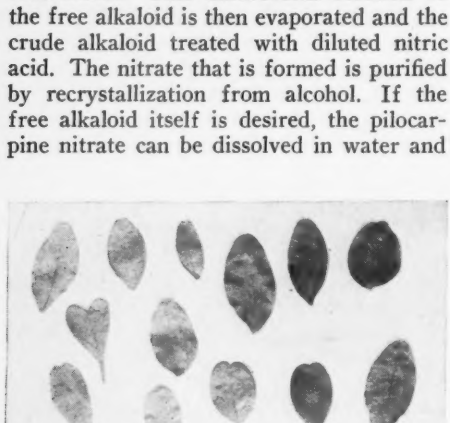
Source.—The official salts are obtained from an alkaloid extracted from two species of plants known as *Pilocarpus Jaborandi* and *Pilocarpus microphyllus*. These are shrubs indigenous to Brazil. From them the leaflets are collected and dried. According to the country where it is grown, the common term assigned to it by the natives, or the part of South America from which it is exported, the drug assumes various names, many of which are valueless since they represent identical species. The large-leaved Pilocarpus (*Pilocarpus Jaborandi*) is also known in commerce as Pernambuco Jaborandi; and the small-leaved drug (*Pilocarpus microphyllus*) is also called Maranham Jaborandi. The other trade names are Paraguay, Ceari, Aracati, and Rio Janeiro Jaborandi.

The shrubs, which grow in forest clearings along slopes, attain as much as ten feet in height. These bear compound leaves which are of a pale green color, and from these the leaflets are pluckd and allowed to dry. They are then packed in bales and usually shipped from Ceara or Pernambuco (Recife). The leaflets come either whole or broken, and often mixed with stems or leaf-stalks. They are of a dull greenish-brown color somewhat oval or oblong in shape, the base being either acute or tapering and the apex having a characteristic indentation termed "emarginate." The margin of the blade is entire or smooth, and the veins, which come from the mid-vein, meet to form two parallel wavy veins which run close to the outer margin. The texture is leathery; there is a slight odor due to a volatile oil, and the taste is salty and bitter. The leaflets vary from five to fifteen centimeters in length and about a third or half as wide according to the species.

Preparation. — The leaflets themselves are not much employed in medicine, but a fluid extract is prepared with the aid of alcohol. The crude drug contains some volatile oil (about 0.5 per cent), and from 0.5 to 1 per cent of alkaloids; the small-leaved species yielding more than one per cent at times. There are a number of alkaloids besides pilocarpine, such as jaborine, pilocarpidine, isopilocarpine, jaboridine and jabonine.

The alkaloid is extracted from the leaflets as follows: The finely powdered crude drug is moistened with sodium carbonate solution and then extracted with warm benzene. The percolate obtained contains the

free alkaloidal pilocarpine. The mixture is shaken with dilute hydrochloric acid, which forms the soluble hydrochloride, and the separated acid liquid is made alkaline with sodium carbonate and is then shaken with chloroform. This chloroform solution of the free alkaloid is then evaporated and the crude alkaloid treated with diluted nitric acid. The nitrate that is formed is purified by recrystallization from alcohol. If the free alkaloid itself is desired, the pilocarpine nitrate can be dissolved in water and



treated with ammonium hydroxide, shaken out with chloroform and then allowed to evaporate to dryness. The alkaloid is not official, but the two salts, pilcarpine nitrate and pilocarpine hydrochloride, are official U.S.P. preparations. There are a number of unofficial salts such as the borate, hydrobromide, salicylate, sulphate, valerate and phenolate.

Properties. — Pilocarpine ($C_{11}H_{16}N_2O_2$) itself, is a liquid alkaloid which has no color or may be slightly yellow, and is syrupy in consistency. It is readily soluble in water, alcohol and chloroform; is easily decomposed in air and the presence of light, and is incompatible with such salts as silver nitrate, potassium permanganate, bichloride of mercy, gold salts, iodides tannin, and alkalies. Because of its instability, its salts are mostly used in its place.

Pilocarpine nitrate ($C_{11}H_{16}O_2N_2.HNO_3$) is the salt obtained by neutralizing pilocarpine with dilute nitric acid, followed by concentration and crystallization. It consists of colorless, shining crystals or a crystalline powder, soluble in water and alcohol, but insoluble in chloroform and ether. It melts at 170°-173°C. and is incompatible with the same substances as the alkaloid. It is stable in air.

Pilocarpine hydrochloride, the other official salt, is made by neutralizing pilocarpine with dilute hydrochloric acid, concentrating the solution and setting it aside to dry over sulphuric acid to crystallize. It has the formula $C_{11}H_{16}O_2.HC_1$. It consists of colorless, odorless translucent crystals which have a bitter taste. It is distinctly hygroscopic when exposed to the air and must therefore be kept in well-stoppered containers. It is soluble in water, alcohol and slightly so in chloroform, but is insoluble in ether. It has the same incompatibilities as the nitrate, in fact it is even less stable. It melts, when dried, at 195°-198°C.

Action.—Pilocarpine and its salts have an action which resembles closely that of physostigmine or eserine. Its external use is limited to its topical application in the eyes, where it exerts a myotic effect stimulating the nerve endings and causing pupillary contraction which lasts for a few hours only. There is a bulging of the lens and fixation of the eye in accommodation for short distances, and a dull pain ensues from the continued muscular contraction. The intra-ocular tension is at first increased, but there is a subsequent fall coincident with the myotic effect, due to the increased escape of fluid which follows the opening of the lymphatic outlets. There is also some place for this drug externally where an increase in hair growth is desired, the action being probably due to the effects on the secretory glands since similar effects may be obtained from injections hypodermically.

Internally, pilocarpus or jaborandi is well known for its secretory effects. On humans it has marked effects on the sudorific glands, but on some of the domesticated animals this action is somewhat replaced by an increased salivary flow. Here, the secretion is enormously augmented due to a direct excitation of the secretory nerve-endings. Although it stimulates the secretion of the digestive tract less markedly

than it does the salivary apparatus, there is some increase of gastric and intestinal juices and these are usually richer in enzymatic contents, as has been shown by the recent work of Babkin and Barlow. The peristaltic function is increased due to a contraction of the intestinal muscles from stimulation of the peripheral nervous apparatus, and for this reason pilocarpine has a place as an effective purgative. The same contraction of smooth muscle in the eye, that has been mentioned, occurs also in the urinary bladder and the bronchioles. The effect on circulation varies somewhat with the animal, usually resulting in a decreased heart action and lowered blood pressure from stimulation of the vagus-endings. It is considered a cardiac depressant in large doses due to both vagus and direct cardiomuscular effects, and therefore the margin of safety is limited. On the respiratory tract, particularly when large doses are given, there is a dual action, namely; the contraction of the bronchioles and the increased secretion of mucous. For this reason, even in moderate doses, the drug will cause dyspnea in horses having heaves; and in larger amount may cause a dangerous edema of the lungs. Policarpine also increases the secretions of the nose, ear, kidneys, lachrymal and mammary glands.

Therapeutics.—Pilocarpus or its alkaloidal salts are employed externally in combination with other cutaneous stimulants such as cantharides or capsicum as a tonic to increase the hair growth in certain cases of alopecia. It is also used in place of eserine in strengths of 0.5 to 2 per cent as a myotic, since it is less painful.

Its main use in veterinary medicine, however, is found in combination with physostigmine or eserine to increase peristalsis and secretion in the digestive tract and thus relieve such conditions as obstinate constipation or impaction of the rumen and omasum, as well as acute gastritis. It is considered a prompt and effective purgative in these cases, and should be administered subcutaneously. It has some use as a diaphoretic, but this effect is seen mostly in the horse. Some still recommend its use in cardiac dropsy, renal dropsy and pleuritic effusions with the object of hastening the elimination and reducing congestion, but this use has been attended with marked edema and collapse, so that here it is contraindicated. It should, for this reason, not be used for animals having colic or other digestive disturbances, when there is a weak heart or other such disease, when there is lung disease such as pneumonia or bronchitis, when there is pharyngitis, since secretion is too excessive, and when there is tetanus. It is also unsafe to administer to pregnant animals since it is active enough to induce abortion. It is pharmacologically the direct opposite of belladonna or atropine and therefore may be used as an antidote when overdoses of the latter have been given.

	Dose *Table*	*Apothecary*	*Metric*
Pilocarpus (fluidextract)	H —	3ii-vi	8—15
	C —	3iii-vi	12—24
	S —	3ss-i	2—4
	D —	3mv-3i	3—4
Pilocarpine and salts	H —	gr. ii-v	.13—.3
	C —	gr. iii-vi	.2—.4
	S —	gr. 1/10-2/3	.006—.04
	D —	gr. 1/30-1/3	.002—.02

Toxicology.—The symptoms of poisoning by pilocarpus resemble those of physostigmine. There is prostration without loss of consciousness. The symptoms appear from five to fifteen minutes after the injection, and salivation becomes very profuse with some degree of sweating. There is sometimes vomiting, intestinal colic and purging; a slow, weak pulse and very difficult breathing, the latter due to an "internal drowning" due to the edema caused by excessive secretions in the contracted bronchioles and bronchi. Cattle seem to withstand large hypodermic doses without great danger; horses are less resistant, and dogs appear to be quite sensitive to the drug. The treatment indicated is to give atropine hypodermically, care for the collapse by strychnine and support respiration with ammonia preparations. It may here be noted that when pilocarpine is employed as an antidote for atropine poisoning, an enormous amount of the former must be given to counteract the latter since it is less powerfully antagonistic in such cases.

Abstracts

Disease Statistics

The care for the health of our domestic animals demands the application of all our faculties.[109] Useful statistics are an excellent aid for the centralization of efforts toward controlling and checking infectious diseases. Statistics of diseases of live stock will reveal information concerning the prevalence of diseases in certain localities, their course in different years, their dependence upon season and climate, their variation incident to size of flocks, their relationship to the soil, to feeding, to hygienic conditions and diseases incident to the rearing of offspring. The collection of mass statistics is equivalent to an experiment for the investigation of epizootics on a large scale; it will form the basis for uniform and systematic action in combatting live stock diseases. Meat inspection service is a fertile source of statistics; it will disclose valuable information on tuberculosis, mastitis, echinococcosis, fascioliasis, trichinosis, cysticercosis and bacterial meat poisoning.

HYPERPLASIA OF THE UTERINE WALL IN DOGS

The author[112] describes a disease seen in older bitches and female cats which had never been bred. He distinguishes an acute and a chronic form. The former is characterized by a dark red, odorless, watery discharge from the *uterus;* the latter by a light pink or colorless discharge, enlargement of the uterine horn and sensitivity of the uterus to pressure. Complications are septic and purulent endometritis and pyometra. Autopsy reveals enlarged ovaries and persistent follicles and follicular cysts. The endometrium is found covered with numerous cysts of varying sizes. Treatment for cases without complication consists in the application of hypophysis anterior and posterior-lobe hormones, and lutein preparations. Of nine cases treated thus, five resulted in recovery. For those cases which do not respond to treatment, or which are characterized by complications, hysterectomy is recommended.

SURGICAL TREATMENT OF CANKER OF THE EAR

Hinz[113] describes the following operation for the treatment of otitis externa verrucosa: Local or general anesthesia is applied. The direction of the auditory canal is ascertained by the insertion of a probe. The auditory canal is then split open as far down as the osseous part. After removal of the hypertrophy, the wound is sutured by placing the external skin in apposition to the inner membrane of the auditory duct. This will insure primary healing. After about six days, following the operation, the dog is ready to leave the hospital.

ETHER TREATMENT FOR SHIPPING FEVER IN HORSES

The author's conclusions[114] are based on the observation of 59 cases of infectious bronchitis in newly imported horses. According to Waldmann and Köbe, the epizootic was caused by a filterable virus. The symptoms are similar to those of influenza in man. Infection is acquired in dealers' stables and through common watering troughs. The symptoms are rise in temperature to 40°C. and higher, a vigorous, moist cough, purulent rhinitis, sometimes angina and conjunctivitis. The lymphnodes are rarely enlarged. The course of the disease is benign and lasts from 10 to 15 days. Strangles, broncho-pneumonia and pleuropneumonia may cause complications of this disease. Intramuscular ether injection has proved to be the most efficient treatment. The ether doses may be increased to 7.5cc.

[109] V. Nida. 1935. Die Statistik als Bekampfungs grundlage bei Tierkrankheiten. (Statistics as a basis for the control of epizooties.) *Deutsch Tierarzteblatt* 2(8): 130-132.

[112] Hetzel, H., 1935. Die Hyperplasia Glandularis Cystica Endometrii beim Hunde, (Cystic Hyperplasia of the Glandular Portion of the Uterus Wall in Dogs). *Wien. Tierarztl, Monatoschr.*, 22:15, p. 476.

[113] Hinz, W., 1935. Zur Operativen Behhandlung der Otitis Externa Verrucosa des Hundes, (Surgical Treatment of Otitis Externa Verrucosa in Dogs). *Tierarztl. Rundshau*, 41:25, pp. 399-401.

[114] Argun, T., 1935. Beiträge zur infektiösen Bronchitis der Pferde und zur Behandlung mit Äther injektionen (Ether Treatment of Infectious Equine Bronchitis); *Wien. Tierärztl. Monatsschr.*, 22:15; 458-462.

INSUFFLATION FOR HOLDING BACK OF MILK

The author[115] describes two cases in which the insufflation of air into the vagina by means of rubber hose and air pump relieved the nervous tension responsible for the holding back the milk in two cows, one of which had lost her calf by death and the other one had the calf weaned from her. In both cases, the cow "let down" and the milk flowed freely immediately following this procedure, yielding six liters for each cow. It was not necessary to repeat the procedure.

* * * *

PORCINE DYSTOCIA

In those cases in which the hand is unable to enter the pelvis, there are three methods available for delivery[116]: (1) the use of forceps, (2) the use of loops and (3) the use of eye-hooks. An additional, indirect, method is the use of drugs stimulating labor pains. If one or more pigs have been delivered already, then the prognosis is favorable. The cause is probably a relatively large fetus or a malformation by unimpaired labor, it may be a premature impairment of labor. In the former case, the head or the hind legs have already entered the pelvis, rendering delivery rather simple. If the fetus cannot be felt, then labor stimulating drugs have to be employed. If these fail, then the forceps, loops or eye-hook must be used, depending on the presentation.

When the genital canal is roomy and easily admits the hand, then the eye-hooks or the loop, or hypophysis extracts may be employed at once. If the hand of the veterinarian is quite small, the easiest method is to grasp the lower jaw of the fetus by placing the index finger inside the mouth and exert counter pressure with the thumb from underneath. In pulling, the hand and the fetus are turned about 30° to the right or left, facilitating the extraction. If the hindlegs are presented first, then the index finger is placed across the achilles tendon of both extremities and the remaining fingers are placed on the plantar side of the metatarsi. The fetus is extracted by pulling. Embryotomy is impracticable. To prevent puerperal sepsis, the instruments must be sterilized. Lubrication must not be neglected.

* * * *

DIAGNOSIS OF HOG CHOLERA

Experiments of the author[117] demonstrated that the intravenous injections of his six-week-old antigen was capable of producing a strong reaction in pigs suffering from hog cholera, while the same injection into healthy pigs, or immunized pigs, or pigs suffering from other febrile diseases, failed to produce any reaction.

* * * *

DISEASES OF COLTS

Infections with streptococci and with *Shigella equili* are considerably more important[118] than those with *Salmonella paratyphi* and *Corynebacterium pyogenes*. Infections with *Salmonella abortivo-equina* will end usually fatally within 24 hours. Mortality from Shigella infection is to be reckoned with from the first to the fourth day; from streptococcic infection mainly from the third to the fifteenth day. Corynebacterium infections do not occur until the sixth or seventh week. Generally speaking, the diseases of the colts are considered as intravital infections, even though often a casual relationship between colt and mare had been noted. The Salmonella abortivo-equina infections are always intra-uterine. The combating of these diseases has to be done on the basis of hygienic and sanitary measures. In Shigella infection the intravenous injection of 50 to 100cc of high valent pyosepticus serum immediately after birth, is to be recommended. To prevent streptococcic infection, the mare's milk should be examined; in the treatment, specific vaccines are to be preferred to polyvalent vaccines.

[115] Ritter-Rittershain, 1935. Luft insufflation in die Scheide gegen das "Aulziehen der Milch," (Air-Insufflation into the Vagina to Overcome "Holding Back of the Milk"); *Wien. Tierarztl. Monatsschr.*, 22:13; 395-396.

[116] Kostner, M., 1935. Beiträge zur Feburtshilfe beim Schwein (Obstetrics in Sows); *Wien. Tierarztl. Monatsschr.*, 22:12; 353-366.

[117] Sarnowiec, W., 1934. A New Method for the Diagnosis of Hog Cholera (Trans. title). *Bul de l'Acad Vet. de France*, 7:201-204.

[118] Miessner, H. and A. Köser, 1935. Fohlenkrankheiten. (Diseases of Colts). *Deutsche Tierärztl. Wohnschr.*, 43:10, pp. 145-50.

EFFECTIVE PARASITICIDE FOR TICKS

A 0.21 per cent solution of sodium arsenate has been found to be a practical parasiticide against ticks on horses.[119] This concentration is harmless to horses, but 66.6 per cent efficient in killing the ticks. Lower dilutions are less efficient; higher dilutions, while more efficient in killing tickets, are very toxic for horses.

Arsenic trihydride in a kerosene-soap emulsion, in concentration of 0.21 per cent, proved 83.3 per cent efficient after four applications. The best method of application is by rubbing. The lethal effect is most pronounced during the first 24 hours. Areas of the body which are meagerly saturated with the solution show a lower percentage of killed ticks than areas where the solution has been rubbed in well. The amount of solution for a single application varies between three and five liters.

SOURCE OF TUBERCULOSIS IN CALVES

Experiences from meat inspection[120] in the province of Saxony indicate that the majority of cases of calf tuberculosis is not acquired by the ingestion of milk containing tubercle bacilli. Young calves which exhibit tubercular lesions have acquired this infection, in most cases, during the intra-uterine period; the germ having been carried to the fetus with the blood in the navel vein. Even after birth, the alimentary infection plays a minor role; airborne transmission being the more common. When tuberculosis of alimentary origin is encountered, then one will find intestinal lesions, or lesions of the regional lymph glands. The presence of congenital tuberculosis presupposes the presence of a uterine tuberculosis in the cow.

[119] Tschebotorow, R. S., 1935. Arsenigsaure Natriumlösung als Abtötungsmittel genen Zecken Piroplasmen und Nuttallioseubertrager bei Pferden, (Arseniate of Sodium a Parasiticide Against Disease-Carrying Horse-Ticks). *Tievarztl. Rundschau*, 41-25, pp. 402-6.

[120] Rautmann, H., 1935. Ein Beitrag zur Pathogenese der Kalber tuberkulose auf Grund der Fleischbeschau befunde in der Proving Sachsen, (Pathogenesis of Calf Tuberculosis from the Point of View of Meat Inspection). *Tierarztl. Rundschau*, 41-23; pp. 367-72.

ADVANTAGE OF BIPP IN FISTULOUS TRACTS

The use of paste in the treatment of fistulas, abscesses and deep flesh wounds is indicated then, when there are no foreign bodies or necrotic tissues in the depth of the cavities, and when the horse is capable of performing work.[121] The advantage of the disinfecting pastes is their continuous contact with the surfaces of the wound; they also have an inhibitory action upon secretion. In addition they prevent the spread of infection into the deeper layers of the tissue, so often observed when watery disinfectants are used.

DIAGNOSIS OF INFECTIOUS ANEMIA

Studying the morphology of the red blood cells of horses, Mrowka[122] made the observation that in the case of swamp fever, the structure of the bloodcells exhibits certain differences. The author was able to make the diagnosis of infectious equine anemia long before the horses showed any clinical symptoms. In two of the horses the diagnosis was confirmed on autopsy some time later.

RELIEF OF INTESTINAL OBSTRUCTION

In cases of persistent constipation or mechanical obstruction, the medicinal therapy in form of injection is not only useless, but even harmful.[123] Rupture of the intestine is often unavoidable, when drastic drugs are given. Drugs are given per os likewise fail to effect relief. The only alternative to remove intestinal obstruction is by means of pressure clysm with the aid of an intestinal tampon. By the use of epidural anesthesia, as much as

[121] Burger, U., 1934. Die Behandlung von Fistulu, Abscesshohlen und tiefen Muskelwunder mit desinfigierenden Pasten. (Treatment of fistulas, abscesses, and deep wounds by means of pastes.) *Zeitschr. f. Veterinark.* 46(9):321-329.

[122] Mrowka, F., 1935. Uber die Veränderung der Struktur der roten Blutkörperchen beim gesunden und kranken Pferde; (Changes in the Structure of Erythrocytes of Horses in Health and in Disease). *Arch. Tierheilk*, 69:3, pp. 167-174.

[123] Krupski, A., and H. Osterwalder, 1935. Obturatio intestini infolge Futterkonkrement beim Pferd; (Intestinal Obstruction in Horses due to Food Concretion). *Schweiz. Arch. f. Tierheilk.*, 77:6, pp. 306-312.

100 liters may be infused without harmful effects to the horse and without danger to the operator. Either 20cc of a 12% or 40cc of a 0.5 per cent tritocain solution are sufficient to insure anesthesia.

TUBERCULOSIS INFECTION IN CALVES

In rearing of calves, special care must be taken to guard against airborn tuberculosis infection;[124] next in importance is the problem of congenital tuberculosis, which plays a rôle in about 30% of tuberculous calves. In order to diagnose tuberculosis in calves, the tuberculin test should be applied every three months. The milk fed should be pasteurized, else infection will gain entrance through the intestinal tract. When these three possibilities of infection are guarded against, then it is possible to raise calves free from tuberculosis.

RELATION OF NERVOUS SYSTEM TO REPRODUCTIVE FUNCTIONS

The vital phenomenon of visceral function of which propagation is largely a part, is regulated by the visceral nervous system and the endocrinal system. The activity of the endocrine glands is dependent upon the innervation from the sympathetic and parasympathetic nerves. On the other hand, the visceral nervous system is influenced by the internal secretion of the endocrine glands. Freig[125] reasons that the disturbances of ovarian function are due rather to interorganic influences than to local causes. The endocrine glands of the female reproductive system, in a general sense, are the hypophysis, the ovary (follicle, corpus luteum) and the endometrium. They are subject to influences from the rest of the endocrine system and from the visceral nervous system. They act upon the sexual apparatus and upon the entire body. The glandular part of the hypophysis occupies a paramount position because it determines the onset of puberty and the later developments of the ovary. The stimulus comes, probably, from a genital center in the brain. Pathological processes in one link of this chain are bound to influence the other links, either in an inhibitory or in an exalting sense. Proof for this relationship is seen in sexual infantilism, premature senility, eclampsia, the sinking of the broad ligiments in pregnancy, cystic degeneration of ovaries, nymphomania and parturient paresis.

AIR BUBBLES IN BLOOD VESSELS

Investigating the mechanism of death from aeremia[127] on dogs and horses, Lapolla found that an air embolus in an artery is relatively harmless, because in the course of the bloodstream branching off into smaller arteries and arterioles, the air bubble is split again and again, and finally absorbed. However, an air embolus in the jugular vein is fatal for the reason that the air on entering the proventricle and ventricle of the heart becomes lodged there permanently, on account of its elasticity. As a result, the left ventricle and the coronary vessels cannot be supplied with blood.

TECHNIQUE FOR REMOVAL OF THE KIDNEY IN THE COW

To extirpate the right kidney in a cow, the skin in the region of the right flank is cut horizontally, from the thirteenth rib backward to a length of about six to eight inches.[126] After cutting the fascia, the kidney may be peeled out of the fat capsule and severed from the peritoneum. The artery, vein and ureter are ligated and then the kidney is extirpated. Ligation of blood vessels, drainage and suture concludes the operation.

[124] Rautmann, H., 1935. Wie erfolgt die Tuberkulose-Infektion des Kalbes und welche Massnahmen sind zur Verhutung der Aristeckung erforderlich; (The Portal of Tuberculosis Infection in Calves and Protective Measures). *Tierärztl. Rundsch.*, 41:33, pp. 529-534; 41:34, pp. 547-550.

[125] Freig, W., 1935. Beziehungen des vegetativen Nervensystems zu Störungen der Fortpflanzung beim weiblichen Rind, (Relationship Between the Visceral Nervous System and Disorders of Reproduction in Cows). *Berl. Tierarztl. Wchnschr.*, 51:433-438.

[127] Lapolla, L., 1934. Death Due to Entrance of Air Into the Blood Vessels (Translated title). *LaClinica Vet.*, 57:8, pp. 593-606.

[126] Köster, O., 1935. Beitrag zur Frage der Technik der Wierenexstirpation bei der Kuh, (Extirpation of the Kidneys in Cows). *Tierarztl. Rundsch.*, 41:38, pp. 612-613.

To extirpate the left kidney, the skin is cut vertically in the hollow of the flank. Then the muscle, fascia and peritoneum are incised. By inserting the hand into the abdominal cavity, the left kidney is readily located, being suspended from the mesentery. The kidney is pulled to the wound opening and the vessels, including the mesentery are ligated and the kidney is extirpated. If the bleeding has been well controlled and asepsis has been adhered to rigidly, drainage is not necessary when suturing.

EFFECT OF AMNIOTIC FLUID ON BR. ABORTUS

Studying[130] the toxicity of filtrates of liquid cultures of *Br. abortus* upon various nutrient media and during different periods of growth, it was found that growth ceased when liquor amnii was added which was obtained from animals during the early part of their gestation, while the addition of liquor amnii obtained from animals during the latter part of their gestation caused luxurious growth. In view of the fact that epizootic abortion does not occur usually until the latter part of gestation, this observation is very significant. The filtrate of liquid media of cultures of *Br. abortus* did not contain toxic substances, while filtrates of a suspension of *Br. abortus* cultures upon agar slopes produced the Schwarzmann phenomenon.

INFLUENCE OF MAGNESIUM ON RICKETS

Experiments in feeding plants deficient in soil-alkali, and therefore containing phosphorus in excess, to weanling calves, demonstrated that this nutritive ratio had a ricket producing effect in spite of the fact that the calcium and phosphorus supply (relative to the absolute supply of these minerals) was sufficient.[128] Thus, the opinion that rickets or osteomalacia in ruminants is due exclusively to phosphorus-deficient food is definitely shattered. The magnesium plays a much lesser role than calcium in the intake and outgo of the body. When analyzing the mineral contents of food, the information of the calcium-magnesium content, and of the phosphorus content is to be preferred to the declaration of the calcium-phosphorus ratio, because the magnesium possesses the power to inhibit the ricket-producing effect of any excess phosphorus present in the food. Thus the magnesium is able to prevent the development of rickets or it may effect a cure of already existing rickets.

COMPLEMENT FIXATION TEST FOR TUBERCULOSIS

Investigations concerning[129] the application of complement fixation in the diagnosis of udder tuberculosis, carried out on 1,425 milk samples, revealed that the complement fixation will indicate the presence of tuberculosis of the udder in 66.7 per cent when milk serum is used for the test; in 78.25 per cent when skim milk is used; and in 81.7 per cent when whole milk is used. The number of spontaneous inhibitions with milk serum was found to be 9.1 per cent; with skim milk, 1.4 per cent and with whole milk, only 0.84 per cent. The unspecific reactions numbered 33.7 per cent with milk serum; 21.75 per cent with skim milk; and 18.3 per cent with whole milk. Whenever the complement fixation results in a positive test, the evaluation of the serum may be facilitated by the additional microscopical examination of the cell picture.

[128] Marke, I., O. Wellmann and L. Urbanyi, 1935. Rhachitis-versuche beim Kalbe und die Rhachitis-Aetiologie, (Experiments on Calves to Determine the Etiology of Rickets). *Arch. Tierheilk*, 69:3. pp. 151-166.

[129] Zinn., H., 1935. Vergleichende Versuche mit Vollmilch, Magermilch and Milchserum zur Feststellung der Euter tuberkulose durch die Komplement bindungs methode, (The Complement Fixation Text and Aid in the Diagnosis of Tuberculosis of the Udder). *Tierarztl. Rundsch.*, 41:38, pp. 613-617.

[130] Zuwerkalow, D., W. Fischbein and A. Juranoff, 1935. Die Toxinbildung der Brucella Abortus and das Phänomen Schwarzmanns, (Toxin Formation of Brucella Abortus and the Schwarzmann Phenomenon). *Arch. Tierheilk.*, 69:3, pp. 224-228.

Vol. XXX Subject Index 1935

A

Abdominal Viscera Displaced, 264
Abortion in a Cow, 349
Acanthosis Nigricans, 400
Acetonemia, 146, 246, 360, 402
Agglutination Test, 168
Aloes, 371
Aloin, 371
Amebic Dysentery, 549
American Public Health Ass'n, 528
A. V. M. A. Election, 232
A. V. M. A. 72nd Meeting, 416
Amniotic Fluid, 93, 546
Amputation of an Ear, 354
Anatomy of the Digestive System of Dogs, 442
Anemia, 86, 564
Anesthesia, Epidural, 252, 375, 435
Animals, Care of Caged, 508
Animal Conservation, 520
Animal Disease Control, 332
Animals, Euthanasia in, 167
Animals, Fluor Poisoning in, 375
Animal Food Requirements, 539
Animal Health, Nutrition in, 296
Animal Hospitals, Modernization of, 385
Animal Husbandry, 60
Animals, Imported, Number of 522
Animal Parasites, 307, 312, 374
Animal Plagues, History of, 140
Anthrax, 123, 140, 455
Antigen, 554
Ants, Eradication of, 126
Aphids Disease, 241
Arecoline, 177
Ascariasis of Horses, 353
Ascarids in the Dog, 217
Association, A Practitioners', 383
Atresia, Pyloric, 118
Auburn Dog Ration, 556
Aujeszky's Disease, 84, 133, 135, 137
Azamine, Use of, 38
Azoturia, 146

B

Bacterin, 554
Bang's Disease, 11
Bang's Disease in California, 139
Bang's Disease Reactors, Fate of, 8
Bang's Disease, Test for, 272
Bang's Disease, Testing, 56, 168, 338
Barber or Surgeon, 25, 100
Bathing Dogs and Cats, 411
Bellwood's Abortion Fake, 413
Betel Nut, 177
Bighead in Sheep, 242
Blacktongue, Treatment of, 411
Bladder Adhesions, 109
Blood, Air Bubbles in, 565
Blood Constituents, 82
Blood Examinations, 40, 289
Blood Groups, 412
Blood Homologous, 362
Blood, Interperitoneal Injection of, 410
Blood Transfusion, 83, 412
Blowflies, 50
Bone Ash, 59
Bone Meal, Steamed, 104
Bone, Raw, 57
Book Reviews:
Black's Veterinary Dictionary, 196
Brucella Infections in Animals and Man, 90
Die Kolik des Pferdes und Ihre Behandlung, 91
Lehrgang der Histophathologie, 268
Practical Everyday Chemistry, 90
Veterinary Military History of the U. S., 91, 457, 513
Bots, Prevention of, 50
Br. Abortus, 8, 51, 181, 566
Brucellosis, 85
Bulbar Paralysis, 85
Bulletins, Contradictions in, 518
Bulletins, Experiment Station, 522
Bursa Fabricii, Diseases of the, 224

C

Caged Animals, Care and Treatment of, 508
Calabar Beans, 266
Calcium Boro-Gluconate, 234
Calcium Deficiency, 147
Calcium Gluconate, Indications of, 134
Calcium Gluconate, Patented, 413
Calculi, Urinary, 41
Calves, Fractured Ribs in, 269
Calves, Quintuplet, 530
Calves, Rickets in, 52
Calves, Tuberculosis in, 564, 565
Cancer Causing Chemicals, 517
Canine Distemper, 147
Canine Medicine and Surgery, 396
Canine Typhus, 411
Canker, Treatment of, 562
Cannibalism, Cause of, 94
Carbon Disulphide, Uses of, 390
Cary, C. A., Obituary, 230
Case Reporting, 355
Castration of Colts, 156
Cats, Anus of, 453
Cats, Bathing, 411
Cats, Diseases of, 543
Cats, Enteritis in, 14
Cats, Fractures in, 546
Cats, Hernia in, 545
Cats, Lavage and Gavage in, 19
Cats, Mange in, 439
Cats, Parasites of, 312, 438, 546
Cats, Prescriptions for, 491
Cats, Use of Creolin in, 136
Cattle, Abortion in, 349
Cattle, Acetonemia in, 146, 246, 360, 402
Cattle, Bang's Disease in, 8, 10, 11
Cattle, Br. Abortus in, 181
Cattle, Claw Amputation in, 137
Cattle, Coccidiosis in, 243
Cattle, Conception in, 51
Cattle, Corn Stalk Disease in, 65
Cattle, Cyanogen Poisoning in, 57, 347
Cattle, Digestive Disturbances in, 165
Cattle, Dystocia in, 166
Cattle, Empyema of, 203
Cattle, Epidural Anesthesia in, 252
Cattle Feeding, Emergency, 206
Cattle, Genital Disease in, 134
Cattle, Influenza in, 273
Cattle, Leucemia of, 269
Cattle, Lumpy Jaw in, 402
Cattle, Mad Itch in, 84
Cattle, Mastitis in, 105, 273, 357, 429
Cattle, Metritis, in, 360
Cattle, Narcosis in, 133
Cattle, Nephritis in, 408
Cattle, Number of, 215
Cattle, Ovaries of, 133
Cattle, Parasites of, 311
Cattle, Poisoning in, 202
Cattle Reduction, 56
Cattle, Respiratory Disease in, 181
Cattle, "Stiffs" in, 49
Cattle, Sweet Clover Disease in, 247
Cattle, Symptoms of Pain in, 454
Cattle, Toxemia in, 164
Cattle, Trichomonads in, 239, 350
Cattle, Tuberculin Testing in, 52
Cattle, Vulvitis in, 180
Cattle, Warbles in, 85
Cerates and Ointments, 106
Charcoal ,Intravenous Injections of, 415
Charleston, Practice in, 528
Chenopodium Poisoning, 410
Chloral Hydrate Narcosis, 182
Chloral Narcosis, 412
Cleft Palate in a Goat, 136
Clinic, Mississippi Valley, 395, 407
Clostridium botulinum, 3
Coccidiosis, Bovine, 243
Coccidiosis, Cecal, 49
Coccidiosis in Animals, 451
Coccidiosis in Horses, 40
Colts, Diseases of, 563
Colic, 41, 171, 200
Colloidal Iodine, Effects of, 215
Concretion, Intestinal, 135
Conferences, Veterinary, 138, 275
Congress Expert, International Veterinary, 191
Congress, International Veterinary, 42, 87, 96, 271
Congress, World Fancier, 99
Consumers, Ultimate, 58
Convulsions, 144
Corn Stalk Disease, 65
Corpus Luteum Retained, 536
Corynebacterium Infection, 563
County Agent, The, 210, 520
Cow Pox, 83
Cow, Removal of Kidney from, 565
Creolin Dangerous, 136
Cryptorchid, Cysts in, 268
Cyanogen Poisoning, 57, 79, 202, 347

D

Dairy Industry, The Ohio, 380
Dairy Products, 316
Deer, Pneumonia in a, 369
Dentistry, Ancient, 522
Dermoid Cysts, 268
Dhobie Itch, Equine, 95
Diabetes, 146
Diet, Importance of, 2
Digestion, Physiology of, 276
Digitalis, 71
Dinitrophenol, Action of 229
Disease an Industry, 520
Disease Carriers, 124
Diseases of the New Born, 412
Disease Statistics, 201
Disease Vectors, 1
Distemper Prophylaxis, 553
Distemper, Resistance to, 192
Distemper Vaccination, 547
Dog Food a Delusion, Cheap, 13
Dog Food Code, The, 54, 188
Dog Food, Requirements of, 556
Dog Food Standards, 128
Dog Industry, The, 522
Dog Laboratory, The, 330
Dogs, Abdominal Hernia in, 174
Dogs, Adhesions in, 109
Dogs, Amebiasis in, 549
Dogs, Anatomy of the Digestive System, 442
Dogs, Anthrax in, 123
Dogs, Anus of, 453
Dogs, Bathing, 411
Dogs, Blacktongue in, 270, 411
Dogs, Blood Transfusion in, 83
Dogs, Cecal Ablation in, 433
Dogs, Diagnosis in, 323
Dogs, Diets of, 212
Dogs, Displaced Organs of, 264
Dogs, Distemper in, 192, 547
Dogs, Dystocia in, 462
Dogs, Enterotomy in, 173
Dogs, Faithfulness of, 6
Dogs, Feeding, Problems in, 499
Dogs, Filariasis in, 493
Dogs, Follicular Mange of, 225
Dogs, Fractures in, 259
Dogs, Fright Disease in, 37
Dogs, Gastro-Enteritis in, 319

To extirpate the left kidney, the skin is cut vertically in the hollow of the flank. Then the muscle, fascia and peritoneum are incised. By inserting the hand into the abdominal cavity, the left kidney is readily located, being suspended from the mesentery. The kidney is pulled to the wound opening and the vessels, including the mesentery are ligated and the kidney is extirpated. If the bleeding has been well controlled and asepsis has been adhered to rigidly, drainage is not necessary when suturing.

EFFECT OF AMNIOTIC FLUID ON BR. ABORTUS

Studying[130] the toxicity of filtrates of liquid cultures of *Br. abortus* upon various nutrient media and during different periods of growth, it was found that growth ceased when liquor amnii was added which was obtained from animals during the early part of their gestation, while the addition of liquor amnii obtained from animals during the latter part of their gestation caused luxurious growth. In view of the fact that epizootic abortion does not occur usually until the latter part of gestation, this observation is very significant. The filtrate of liquid media of cultures of *Br. abortus* did not contain toxic substances, while filtrates of a suspension of *Br. abortus* cultures upon agar slopes produced the Schwarzmann phenomenon.

INFLUENCE OF MAGNESIUM ON RICKETS

Experiments in feeding plants deficient in soil-alkali, and therefore containing phosphorus in excess, to weanling calves, demonstrated that this nutritive ratio had a ricket producing effect in spite of the fact that the calcium and phosphorus supply (relative to the absolute supply of these minerals) was sufficient.[128] Thus, the opinion that rickets or osteomalacia in ruminants is due exclusively to phosphorus-deficient food is definitely shattered. The magnesium plays a much lesser role than calcium in the intake and outgo of the body. When analyzing the mineral contents of food, the information of the calcium-magnesium content, and of the phosphorus content is to be preferred to the declaration of the calcium-phosphorus ratio, because the magnesium possesses the power to inhibit the ricket-producing effect of any excess phosphorus present in the food. Thus the magnesium is able to prevent the development of rickets or it may effect a cure of already existing rickets.

COMPLEMENT FIXATION TEST FOR TUBERCULOSIS

Investigations concerning[129] the application of complement fixation in the diagnosis of udder tuberculosis, carried out on 1,425 milk samples, revealed that the complement fixation will indicate the presence of tuberculosis of the udder in 66.7 per cent when milk serum is used for the test; in 78.25 per cent when skim milk is used; and in 81.7 per cent when whole milk is used. The number of spontaneous inhibitions with milk serum was found to be 9.1 per cent; with skim milk, 1.4 per cent and with whole milk, only 0.84 per cent. The unspecific reactions numbered 33.7 per cent with milk serum; 21.75 per cent with skim milk; and 18.3 per cent with whole milk. Whenever the complement fixation results in a positive test, the evaluation of the serum may be facilitated by the additional microscopical examination of the cell picture.

[130] Zuwerkalow, D., W. Fischbein and A. Juranoff, 1935. Die Toxinbildung der Brucella Abortus and das Phänomen Schwarzmanns, (Toxin Formation of Brucella Abortus and the Schwarzmann Phenomenon). *Arch. Tierheilk.*, 69:3, pp. 224-228.

[128] Marke, I., O. Wellmann and L. Urbanyi, 1935. Rhachitis-versuche beim Kalbe und die Rhachitis-Aetiologie, (Experiments on Calves to Determine the Etiology of Rickets). *Arch. Tierheilk*, 69:3. pp. 151-166.

[129] Zinn., H., 1935. Vergleichende Versuche mit Vollmilch, Magermilch and Milchserum zur Feststellung der Euter tuberkulose durch die Komplement bindungs methode, (The Complement Fixation Text and Aid in the Diagnosis of Tuberculosis of the Udder). *Tierarztl. Rundsch.*, 41:38, pp. 613-617.

Vol. XXX Subject Index 1935

A

Abdominal Viscera Displaced, 264
Abortion in a Cow, 349
Acanthosis Nigricans, 400
Acetonemia, 146, 246, 360, 402
Agglutination Test, 168
Aloes, 371
Aloin, 371
Amebic Dysentery, 549
American Public Health Ass'n, 528
A. V. M. A. Election, 232
A. V. M. A. 72nd Meeting, 416
Amniotic Fluid, 93, 546
Amputation of an Ear, 354
Anatomy of the Digestive System of Dogs, 442
Anemia, 86, 564
Anesthesia, Epidural, 252, 375, 435
Animals, Care of Caged, 508
Animal Conservation, 520
Animal Disease Control, 332
Animals, Euthanasia in, 167
Animals, Fluor Poisoning in, 375
Animal Food Requirements, 539
Animal Health, Nutrition in, 296
Animal Hospitals, Modernization of, 385
Animal Husbandry, 60
Animals, Imported, Number of 522
Animal Parasites, 307, 312, 374
Animal Plagues, History of, 140
Anthrax, 123, 140, 455
Antigen, 554
Ants, Eradication of, 126
Aphids Disease, 241
Arecoline, 177
Ascariasis of Horses, 353
Ascarids in the Dog, 217
Association, A Practitioners', 383
Atresia, Pyloric, 118
Auburn Dog Ration, 556
Aujeszky's Disease, 84, 133, 135, 137
Azamine, Use of, 38
Azoturia, 146

B

Bacterin, 554
Bang's Disease, 11
Bang's Disease in California, 139
Bang's Disease Reactors, Fate of, 8
Bang's Disease, Test for, 272
Bang's Disease, Testing, 56, 168, 338
Barber or Surgeon, 25, 100
Bathing Dogs and Cats, 411
Bellwood's Abortion Fake, 413
Betel Nut, 177
Bighead in Sheep, 242
Blacktongue, Treatment of, 411
Bladder Adhesions, 109
Blood, Air Bubbles in, 565
Blood Constituents, 82
Blood Examinations, 40, 289
Blood Groups, 412
Blood Homologous, 362
Blood, Interperitoneal Injection of, 410
Blood Transfusion, 83, 412
Blowflies, 50
Bone Ash, 59
Bone Meal, Steamed, 104
Bone, Raw, 57
Book Reviews:
  Black's Veterinary Dictionary, 196
  Brucella Infections in Animals and Man, 90
  Die Kolik des Pferdes und Ihre Behandlung, 91
  Lehrgang der Histophathologie, 268
  Practical Everyday Chemistry, 90
  Veterinary Military History of the U. S., 91, 457, 513
Bots, Prevention of, 50
Br. Abortus, 8, 51, 181, 566
Brucellosis, 85
Bulbar Paralysis, 85
Bulletins, Contradictions in, 518
Bulletins, Experiment Station, 522
Bursa Fabricii, Diseases of the, 224

C

Caged Animals, Care and Treatment of, 508
Calabar Beans, 266
Calcium Boro-Gluconate, 234
Calcium Deficiency, 147
Calcium Gluconate, Indications of, 134
Calcium Gluconate, Patented, 413
Calculi, Urinary, 41
Calves, Fractured Ribs in, 269
Calves, Quintuplet, 530
Calves, Rickets in, 52
Calves, Tuberculosis in, 564, 565
Cancer Causing Chemicals, 517
Canine Distemper, 147
Canine Medicine and Surgery, 396
Canine Typhus, 411
Canker, Treatment of, 562
Cannibalism, Cause of, 94
Carbon Disulphide, Uses of, 390
Cary, C. A., Obituary, 230
Case Reporting, 355
Castration of Colts, 156
Cats, Anus of, 453
Cats, Bathing, 411
Cats, Diseases of, 543
Cats, Enteritis in, 14
Cats, Fractures in, 546
Cats, Hernia in, 545
Cats, Lavage and Gavage in, 19
Cats, Mange in, 439
Cats, Parasites of, 312, 438, 546
Cats, Prescriptions for, 491
Cats, Use of Creolin in, 136
Cattle, Abortion in, 349
Cattle, Acetonemia in, 146, 246, 360, 402
Cattle, Bang's Disease in, 8, 10, 11
Cattle, Br. Abortus in, 181
Cattle, Claw Amputation in, 137
Cattle, Coccidiosis in, 243
Cattle, Conception in, 51
Cattle, Corn Stalk Disease in, 65
Cattle, Cyanogen Poisoning in, 57, 347
Cattle, Digestive Disturbances in, 165
Cattle, Dystocia in, 166
Cattle, Empyema of, 203
Cattle, Epidural Anesthesia in, 252
Cattle Feeding, Emergency, 206
Cattle, Genital Disease in, 134
Cattle, Influenza in, 273
Cattle, Leucemia of, 269
Cattle, Lumpy Jaw in, 402
Cattle, Mad Itch in, 84
Cattle, Mastitis in, 105, 273, 357, 429
Cattle, Metritis, in, 360
Cattle, Narcosis in, 133
Cattle, Nephritis in, 408
Cattle, Number of, 215
Cattle, Ovaries of, 133
Cattle, Parasites of, 311
Cattle, Poisoning in, 202
Cattle Reduction, 56
Cattle, Respiratory Disease in, 181
Cattle, "Stiffs" in, 49
Cattle, Sweet Clover Disease in, 247
Cattle, Symptoms of Pain in, 454
Cattle, Toxemia in, 164
Cattle, Trichomonads in, 239, 350
Cattle, Tuberculin Testing in, 52
Cattle, Vulvitis in, 180
Cattle, Warbles in, 85
Cerates and Ointments, 106
Charcoal ,Intravenous Injections of, 415
Charleston, Practice in, 528
Chenopodium Poisoning, 410
Chloral Hydrate Narcosis, 182
Chloral Narcosis, 412
Cleft Palate in a Goat, 136
Clinic, Mississippi Valley, 395, 407
Clostridium botulinum, 3
Coccidiosis, Bovine, 243
Coccidiosis, Cecal, 49
Coccidiosis in Animals, 451
Coccidiosis in Horses, 40
Colts, Diseases of, 563
Colic, 41, 171, 200
Colloidal Iodine, Effects of, 215
Concretion, Intestinal, 135
Conferences, Veterinary, 138, 275
Congress Expert, International Veterinary, 191
Congress, International Veterinary, 42, 87, 96, 271
Congress, World Fancier, 99
Consumers, Ultimate, 58
Convulsions, 144
Corn Stalk Disease, 65
Corpus Luteum Retained, 536
Corynebacterium Infection, 563
County Agent, The, 210, 520
Cow Pox, 83
Cow, Removal of Kidney from, 565
Creolin Dangerous, 136
Cryptorchid, Cysts in, 268
Cyanogen Poisoning, 57, 79, 202, 347

D

Dairy Industry, The Ohio, 380
Dairy Products, 316
Deer, Pneumonia in a, 369
Dentistry, Ancient, 522
Dermoid Cysts, 268
Dhobie Itch, Equine, 95
Diabetes, 146
Diet, Importance of, 2
Digestion, Physiology of, 276
Digitalis, 71
Dinitrophenol, Action of 229
Disease an Industry, 520
Disease Carriers, 124
Diseases of the New Born, 412
Disease Statistics, 201
Disease Vectors, 1
Distemper Prophylaxis, 553
Distemper, Resistance to, 192
Distemper Vaccination, 547
Dog Food a Delusion, Cheap, 13
Dog Food Code, The, 54, 188
Dog Food, Requirements of, 556
Dog Food Standards, 128
Dog Industry, The, 522
Dog Laboratory, The, 330
Dogs, Abdominal Hernia in, 174
Dogs, Adhesions in, 109
Dogs, Amebiasis in, 549
Dogs, Anatomy of the Digestive System, 442
Dogs, Anthrax in, 123
Dogs, Anus of, 453
Dogs, Bathing, 411
Dogs, Blacktongue in, 270, 411
Dogs, Blood Transfusion in, 83
Dogs, Cecal Ablation in, 433
Dogs, Diagnosis in, 323
Dogs, Diets of, 212
Dogs, Displaced Organs of, 264
Dogs, Distemper in, 192, 547
Dogs, Dystocia in, 462
Dogs, Enterotomy in, 173
Dogs, Faithfulness of, 6
Dogs, Feeding, Problems in, 499
Dogs, Filariasis in, 493
Dogs, Follicular Mange of, 225
Dogs, Fractures in, 259
Dogs, Fright Disease in, 37
Dogs, Gastro-Enteritis in, 319

Dogs, Goitre in, 185
Dogs, Icterus Infectiosus of, 411
Dogs, Interdigital Cysts in, 170
Dogs, Lavage and Gavage in, 19
Dogs, Mange in, 256, 368
Dogs, Narcosis in, 182
Dogs, Neoplasms in, 258
Dogs, Neophritis in, 186
Dogs, Noma in, 484
Dogs, Otitis Externa in, 183
Dogs, Otorrhea in, 441
Dogs, Pancreatic Deficiency in, 185
Dogs, Paralysis in, 393
Dogs, Parasites of, 217, 312
Dogs, Porcupine Quills in, 402
Dogs, Posterior Paralysis of, 145
Dogs, Prescription for, 491
Dogs, Prostatitis in, 445
Dogs, Scabies in, 526
Dogs, Screw Worms in, 176
Dogs, Shock in, 485
Dogs, Skin Disease in, 400, 502
Dogs, Surgical Treatment of, 505
Dogs, Tonsillectomy in, 119, 478
Dogs, Typhus in, 411
Dogs, Weil's Disease in, 411
Dogs, Whipworms in, 480
Dogs, Worming of, 37
Doping Race Horses, 321, 331
Dorset, Marion, Obituary, 377
Drugs Used in Veternary Medicine, 32, 71, 115, 177, 221, 265, 371, 405, 446, 559
Duck Sickness, Western, 3
Dyspnea in Calves, 269
Dystocia, Bovine, 166
Dystocia, Canine, 462
Dystocia, Coincidences in, 166
Dystocia, Porcine, 563

E

Ear, Amputation of, 354
Eclampsia, 144, 352
Ectogenesis, 2
Empyema in the Ox, 203
Encephalomyelitis, Equine, 187, 523
Endometritis, 38
English Sparrows, Extermination of, 124
Ensilage, Corn and Sorghum, 207
Enteritis, Contagious Feline, 14
Enteritis in Grouse, Ulcerative, 394
Enterotomy in a Fox Terrier, 173
Epidural Anesthesia, 375, 435
Eponymic Terms in Medicine, 96
Equine Encephalomyelitis, 187, 523
Eserine, 265
Ethics, Veterinary, 25
Eucalyptol, 405
Eucalyptus, 405
Euthanasia in Animals, 167
Examinations, State Board, 530
Exhibits, Commercial, 42
Eye Diseases, 522

F

Fagopyrismus, 241
Farm Technology Brings Disaster, 197
Feces, Significance of, 358
Fetal Extracts, Use of, 368
Filariasis in Dogs, 220, 413, 493
Filterable Viruses, 26
Fistulous Tracts, 564
Fleas, Treatment for, 51
Flies, Control of, 125
Fluke Prophylaxis, 41
Fluor Poisoning in Animals, 375
Follicular Mange, 225, 368
Food, Selection of, 49
Foot-and-Mouth Disease, 83
Forage Poisoning, 147
Fowl Leucosis, 68
Fowl Paralysis, 3, 68, 216, 227, 271
Foxes, Salt Poisoning in, 375
Fractures and Dislocations, 328
Fractures, Handling of, 259
Francis, Honors Paid Dean, 274
Fright Disease, 37, 145

G

Gastro-Enteritis, Feline, 534
Gastro-Enteritis, Infectious, 545
Gastro-Enteritis of Dogs, 319
Gavage and Lavage in Dogs and Cats, 19
Genetics, Veterinary, 95
Genital Disease of Cattle, 134
Glucose, Administration of, 41
Glycosuria Induced, 411
Goat, Cleft Palate in, 136
Goitre, Heart Lesions in, 41
Goitre, Treatment of, 58
Granulocytopenia, 93, 415
Grouse, Ulcerative Enteritis in, 394

H

Habits, 2
Haux, Ernst, 191
Health Measures, Opposition to, 98
Heart Worm Disease, 493
Hemorrhage, Treatment of, 1
Hepatitis of Young Pigs, 182
Hernia, Abdominal, 174
Histomonas Meleagridis, 3
Hog Cholera, 1, 51, 94, 270, 563
Hogs, Dystocia in, 563
Hogs, Number of, 215
Homologous Serum, 553
Hookworms in Dogs, 218
Hookworms, Treatment for, 525
Hormones and Anti-Hormones, 93
Horses, Ascariasis in, 353
Horses, Azoturia in, 146
Horses, Coccidiosis of, 40
Horses, Colic in, 171, 200, 352
Horses, Cryptorchid, A, 268
Horses, Deafness in, 1
Horses, Decrease of, 57
Horses, Disease of the New Born, 412
Horses, Doping Race, 321, 331
Horses, Eclampsia in, 352
Horses, Epidural Anesthesia in, 252
Horses, Heart Involvement in, 270
Horses, Increase in, 227
Horses, Infectious Anemia of, 564
Horses, Influenza in, 269
Horses, Injuries to, 256
Horses, Molasses for, 82
Horses, Navicular Disease in, 244
Horses, Number of, 6, 184, 423
Horses, Nymphomania in, 408
Horses, Paralysis in, 529
Horses, Parasites of, 207
Horses, Paricarditis in, 272
Horses, Patellar Dislocations in, 272
Horses, Pregnancy Test for, 408
Horse Racing in America, 197
Horses, Shipping Fever in, 562
Horses, Stringhalt in, 198
Horses, Strongyli in, 198
Horses, Swamp Fever in, 86
Horses, Tetanus in, 273
Hospital Sanitation, 137
Hospitalization, 330
Hospitalization and Accounting, 473
Hospitals, Construction of, 261
Humane Associations, 523
Hutyra, Franz, Obituary, 63
Hypocalcemia and Intoxications, 227

I

Illness a Big Business, 330
Illumination, Artificial, 399
Impaction Due to Walnuts, 165
Infection, Conditions Favoring, 41
Inflammation, Treatment of, 88
Influenza, Feline, 543
Influenza in Cattle, 273
Influenza, Pandemics, 205
Inhalant Apparatus, A New, 135
Inoculation, 555
Insemination, Artificial, 453
Interdigital Cysts in Dogs, 170
Intestinal Obstruction, 564
Intoxications and Hypocalcemia, 227
Iodine Treatment of Mastitis, 273
Iron, Availability of, 415

K

Kamala, Virtues of, 518
Keratitis, Ulceratives, 257
Kidney, Ablation of, 565
Kidney Worm Control, 404

L

Laboratory, New Zoological, 61
Lacto Vaccine, 523
Lambs, Pneumonia in, 49
Lambs, Sore Eyes in, 52
Laryngotracheitis in Young Chicks, 213
Laryngotracheitis Vaccination, 172, 250
Lavage and Gavage in Dogs and Cats, 19
Law, The Shurtleff, 382
Laying Mashes for Dog Food, 556
Leadership, Stupid, 379
Leg Paralysis, 147
Lethal Factors in Animals, 375
Light Sensitization, 241
Live Stock Industry, The, 62
Live Stock Raising, 60
Live Stock Regulation, Hackneyed, 332
Live Stock Situation, The, 215
Lungworm in the Dog, 220

M

Mad Itch, 84, 133, 135
Maggot Treatment, 97
Magnesium, Effect of, 528, 566
Mastitis, Control of, 105
Mastitis, Diagnosis of, 149
Mastitis, Diagnostic Tests for, 376
Mastitis in Swine, 238
Mastitis, Lesions of, 133
Mastitis, Obervations on, 357
Mastitis Organisms, 429
Mastiltis Prophylaxis, 523
Mastitis, Treatment of, 5, 273
Measles Prophylaxis, 521
Medical Discoveries, 94
Medical Publicity, 528
Medical Service, Cost of, 522
Medicine, Human and Veterinary, 102
Metabolism, Control of, 88
Metabolism, Theory of, 540
Metritis in Cattle, 360
Metritis, Treatment for, 269
Milk Borne Sore Throat, 94
Milk Control, 535
Milk, Examination of, 429
Milk, Facts About, 110
Milk Fever, 145, 360
Milk Fever, Chemotherapy of, 234
Milk Flush, Value of, 3
Milk, Holding Back, 563
Milk Inspection Regulations, 317
Milk Ordinances, City, 343
Milk Pasteurization, 342, 451
Milk, Vitamin D Reinforcement of, 302
Mineral Requirements, 542
Minnesota Accredited, 52
Misconceptions, Popular, 184
Mosaic Disease, Cost of, 96
Mules, Farmers Prefer Small, 370

N

Nagana in South Africa, 99
Navicular Disease in Horses, 244
Neoplasm of the Brain, 258
Nephritis in Cattle, 408
Noma in Dogs, 484
Nutrition and Distemper, 192
Nutrition, Animal, 539
Nutrition, Canine, 212
Nutrition in Animals, 296
Nux Vomica, 32
Nymphomania in Mares, 408

O

Obligations, Veterinary, 120
Ointments and Cerates, 106

Oklahoma Veterinarians, 336
Oleo War, 531
Organisms, Classifiaction of, 84
Osteomalacia Due to Parasitism, 424
Otitis Externa in the Dog, 183
Otorrhea in Dogs, 441

P

Palisade Worm, 254
Paralysis, Bulbar, 133
Paralysis from Pressure, 529
Paralysis of the Penis, 393
Paraplegia, 145
Parasites, Extension of, 535
Parasites of the Cat, 438
Parasites of the Dog, 217
Parasites, War on, 65
Parasitisms of Animals, 424
Paricardial Sac Draining, The, 272
Parturition, Temperatures in, 181
Pekingese, an Albino, 353
Peritonitis Preventive, 93
Perosis, Cause of, 3
Phlebitis, 82
Physician, Tribute to the, 521
Physostigmine, 265
Pigs, Food for Orphaned, 346
Pilocarpine, 559
Piroplasmosis, Treatment of, 88
Pistor, A. J., Appointed, 64
Pneumonia in a Deer, 369
Pododermatitis, 137
Poisoning, Fluorine, 86
Poisoning, Prussic Acid, 202
Polo Ponies, Injuries of, 256
Porcupine Quill Injuries, 402
Pork, Soft, 523
Poultry Disease Problems, 82, 185, 386
Poultry House Construction, 423
Poultry, Infectious Bronchitis in, 250
Poultry, Laryngotracheitis in, 172, 213
Poultry, Lice in, 523
Poultry, Parasites of, 387
Poultry, Pullorum Disease in, 175
Pox, Carriers of, 412
Practical Suggestions, 437
Pregnancy Disease, 145
Pregnancy Disease in Sheep, 139
Pregnancy Test, 49
Pregnancy Test for Mares, 408
Prescriptions, Veterinary, 107, 491, 492
Prostatitis in the Dog, 445
Protein Requirements, 51
Protein Supplements, 209
Psittacosis, Prevention of, 454, 455
Public Health, 98, 381, 551
Public Health Decisions, 58
Public Health, Veterinary Service in, 282
Publicity, Medical, 521
Pullorum Disease Testing, 175
Puppies, Foods for Orphaned, 351
Pyloric Atresia, 118

Q

Quackery, Official, 334
Quadruplet Foals, 437
Quarantine, Cattle Tick, 62
Questions and Answers, 31, 101, 148, 204, 450

R

Rabbit, Tapeworms in, 529
Rabies, 147
Rabies Almost Contracted, 432
Rabies Control, 94
Rabies, Pseudo, 85, 133
Rabies Quarantines Ineffective, 517
Rabies Racket, The, 377
Rabies, Vaccination Against, 51
Rats, Disease Carriers, 125
Rectal Irrigation, 352
Reproductive Function, 565
Research and the Clinic, 335
Rickets, Treatment of, 566
Rinderpest, 141
Robustness Inherited, 1
Roeland, Doctor, 381
Roentgenological Examination, 36
Round Worms, Treatment of, 525
R. S. P. C. A. Destruction Centers, 423
Ruptured Yolk, 37
Rural Veterinary Practice, 334
Russian Thistle Feed, 206

S

Salmonella Infection, 563
Salsbury's School, 520
Salt Poisoning in Foxes, 375
Sanitation, Motile Foes of, 124
Santonin, 221
Sarcoptic Mange, 256
Sarcoptic Scabies, 526
Science, Requirements of, 517
Screw Worms, 176, 374
Septic Tank, a Concrete, 374
Serum Institute, 87
Services, Liability for Incompetent, 76
Services, Payment for, 120
Services, Scientific Veterinary, 332
Services, Trend of Veterinary, 143
Services, Veterinary, 140, 210
Sex, Predetermination of, 273
Sheep, Bighead in, 242.
Sheep, Myiasis in, 50
Sheep, Parasites of, 309
Sheep, Pizzle in, 50
Sheep, Pregnancy Disease in, 139
Sheep, Spermatogenesis in, 376
Shigella Infection, 563
Shipping Fever, Ether Treatment for, 562
Shock, 485
Skin as a Germ Killer, 346
Skin Diseases, Non-Parasitic, 502
Small Animal Practice, 191, 323, 461, 483
Spaying Mares, 408
Spaying Sows, 410
Spermatogenesis in Rams, 376
Spider, Black Widow, 95
Spirochetosis of Dogs, 270
Spleen, Functions of, 410
Stallion Pulling Contest, 414
State Board Examination, 530
Statistics, Disease, 562
Steddom, R. P., Retired, 64
"Stifling" in Colts, 272
Stomach Worms in Swine, 390
Stringhalt, 198
Strongyles, Viability of, 86
Strongylus Vulgaris, 254
Strychnine, 32
Stuttgart Disease, 270
Surgical Notes, 505
Surra, Treatment of, 95
Swamp Fever Test, 40
Sweet Clover Disease, 247
Swine, Bulbar Paralysis in, 85
Swine, Feed for Orphaned, 346
Swine, Hepatitis in, 182
Swine, Loss from Mastitis in, 238
Swine, Loss of, 434
Swine, Narcosis in, 133, 412
Swine, Parasite Control in, 404
Swine, Parasites of, 311
Swine, Poisoning in, 410
Swine, Spaying, 410
Swine, Stomach Worms of, 390
Synovia, Characteristics of, 272
Synovial Exudates, 85
Synovitis, Treatment of, 135

T

Tannic Acid, 115
Tapeworm Cysts, Rabbit, 529
Tapeworm in the Dog, 218
Tetanus, Ether Treatment of, 273
Tetanus, Treatment of, 134
Tetrachlorethylene, 525
Texas A. & M. College, 274
Ticks, Treatment of, 564
Tissue Cultures, 270
Tissue Toxins, 26
Tonsillectomy in Dogs, 119, 478
Toxemia in a Cow, 164
Trichinae, Development of, 40
Trichinae, Habits of, 40
Trichinosis in Man, 381
Trichinosis, Prevention of, 436
Trichomonad Disease, 239, 350
Trifoliosis, 241
Triplet Foals, 404
Trypanosoma Brucei, 99
Tuberculin, A New, 109
Tuberculosis, 142
Tuberculosis, Complement Fixation Test for, 566
Tuberculosis, Diagnosis of, 40
Tuberculosis Eradication, 414, 437
Tuberculosis, Source of, 564
Turpentine, 446
Typhlectomy in the Dog, 433

U

Udder, Examination of, -85
Undulant Fever Anti-Serum, 93
Unguenta, 107, 108, 109
Univ. of Pennsylvania Semi-Centennial, 229
Urine, Examination of, 524
Uterine Hyperplasia, 562

V

Vaccine, 554
Vaginal Secretions, 84
Veterinary Achievements, 7, 53, 97, 140, 143
Veterinary Association, Early, 517
Veterinary Ethics, 100
Veterinary History, Early, 249
Veterinary History of North Carolina, 104
Veterinary Meeting, Texas, 138
Veterinary Military History, 519
Veterinary Nursing, 195
Veterinary Officers Promoted, 384
Veterinary Periodicals, Circulation of, 335
Veterinary Practice, 518
Veterinary Practice, Rural, 334
Veterinary Prescriptions, 107, 491, 492
Veterinary Reserve, The, 95
Veterinary Responsibilities, 185
Verterinary Service, 521, 551
Vitameter, 517
Virus, 554
Virus, A Chemical, 377
Virus Activity, 224
Vitamin A, 541
Vitamin A in Bacteria, 93
Vitamin B, 541
Vitamin B, Synthetic, 437
Vitamin C, 541
Vitamin C Produced Commercially, 93
Vitamin D, 528, 541
Vitamin D Milk, 302
Vitamin E, 542
Vitamin G, 542
Vitamins and Distemper, 192
Vulvitis in Heifers, 180

W

Warbles, Ox, 85
Water Pollution, Liability for, 532
"Water Seeds," Prevention of, 531
Weil's Disease, 411
Welch, W. H., Obituary, 519
Whipworms Infestation, 480
Whipworms in the Dog, 219
Whipworms, Removal of, 185
Worming and Fright Disease, 37

X

X-Ray, Dangers of, 375
X-Ray Examination, 36
X-Ray Photography, 40
X-Ray Treatment, 58

Z

Zoological Garden Practice, 508

Index of Names

EXPLANATION.—Numbers marked with an asterisk (*) indicate halftones.

A

Ackerman, E. L., 14
Adams, P., 83
Albrecht, A., 133, 375
Anderson, J. S., 395*
Apple, H. J., 14
Argun, T., 562
Ariess, L., 43*, 91, 171
Ashcraft, D. W., 310*
Axby, J. L., 419*

B

Baer, H., 2*
Baker, E. T., 156, 163*, 338
Ballenger, O. E., 170
Baldwin, F. M., 418*
Balton, M., 445
Bang, O., 2*
Barber, L. B., 336*
Barnes, M. F., 419*
Barsky, D., 261
Beach, B. A., 8, 10
Beard, T. G., 491*
Beaudette, F. E., 419*
Behnke, A. E., 2*
Benner, J. A., 37
Bennett, H., 90
Berge, E., 40
Bethke, R. M., 186, 296
Bisanti, C., 2*, 272
Bishopp, F. C., 66
Bixby, D. O., 243
Bolle, W., 86
Bongert, J., 85
Bonifield, H. M., 295*
Bos, A., 412
Bosnic, L., 134
Boughton, I. B., 420*
Bower, Chas. W., 422*
Bozicevich, J., 390
Breed, Frank, 310*
Brenton, S., 519*
Brielman, E. O., 11
Brock, J. C., 118
Brown, R. L., 451
Brumley, O. V., 420*
Bryan, C. S., 4, 93, 149, 429
Buchli, K., 181
Buell, H. J., 342
Bugge, G., 40
Burger, U., 564
Butler, Tait, 7

C

Cain, H. D., 257
Cameron, T. W. M., 92
Campbell, J. A., 462*, 466*
Carpenter, C. D., 421*
Carter, Horace M., 106
Cary, C. A., 230*, 233*
Case, C. H., 277*
Casey, L. E., 478
Cavanaugh, J. L., 203
Christensen, O. N., 207*
Clark, C. F., 536
Close, P. C., 441
Cotton, W. E., 51
Covault, C. H., 297*
Cozzens, J. D., 485*
Croll, F. B., 353
Cuboni, E., 408
Cuvier, Baron, 6

D

DaCosta, M., 270
Damon, Arthur, 217
Darby, H. L., 419*
Davis, D. J., 94, 95, 205
Davis, E. A., 421*
Day, L. E., 419*
DeCamp, C. E., 38
Delbe, M., 83
Demmel, M., 84
Demetre, J., 135
Derrick, J. D., 418*
Dibbell, E. B., 416*, 493*
Dick, G. A., 417
Dinsmore, Wayne, 58, 81, 370, 423
Donahue, M., 244
Donat, L. C., 123
Dorset, M., 377
Dove, W. E., 67*
Dryerre, H., 234
Dubois, E., 423
Dukes, H. H., 186, 276*
Durant, A. J., 136
DuToit, P. J., 2

E

Eastman, D. A., 421*
Eber, H., 37
Edgington, B. H., 280*
Eggert, Wm. E., 256, 264
Ehmer, E. A., 505*
Ehrlich, D., 525
Elber, A., 224
Emmel, M. W., 68
Enigk, K., 86

F

Fassnacht, H., 41
Faulder, E. T., 420*
Faust, E. C., 41
Fazikas, 229
Fechner, H. H., 400
Fenstermacher, R., 418*
Ferguson, T. A., 418*
Fischbein, W., 566
Fischer, Fred., 195
Fitzgerald, T. C., 321*
Fortune, R. L., 526
Foster, E. N., 258
Frahm, E. W., 119
Frank, L. C., 110
Freig, W., 565
Frink, W. E., 136
Fröhring, W. O., 192

G

Gerard, P., 454
Gerlach, F., 2*
Giltner, Ward, 282*, 457, 513, 551
Gilyard, R. T., 254, 350
Glaisyer, A. R., 420*
Goss, L. W., 280*
Gochenour, W. S., 455
Goldhaft, T. M., 250
Goldner, S., 411
Gouseff, W. J., 40
Graham, G. G., 45*
Gran, H., 453
Grassi, L., 43*
Greig, J. Russell, 234, 235*
Grini, O., 408
Grossman, J. D., 287*
Grove, J. S., 336*
Guard, W. F., 277*
Guerrschi, A., 273

H

Hadley, F. B., 79, 357
Haigler, S. W., 421*, 502*
Hall, M. C., 65
Hallman, E. T., 418*
Hardenbergh, J. G., 418*
Harris, H., 49, 51, 499
Hart, E. B., 52
Haupt, H., 84
Haux, Ernst, 191*
Hays, C. H., 421*
Hecke, F., 40
Hein, H., 168
Hemmert-Halswick, A., 40, 133
Henseler, H., 273
Herman, S. E., 432
Herrick, C. H., 2*
Hershey, S. E., 417*, 528
Hetzel, H., 562
Hibbs, L. W., 109
Hills, J. V., 437
Hilyard, W. O., 395*
Hinkle, T. C., Jr., 529
Hinz, W., 562
Hirt, G., 85
Hisel, C. C., 336*, 417*
Hobday, F. T. G., 49
Hofferber, O., 40
Hoflund, S., 41
Hoge, V. M., 456
Holle, A., 408
Holle, J., 408
Holt, A. L., 247
Holth, H., 2*
Holycross, F. L., 293*
Hook, Johnson, 201
Horneck, K., 225
Horning, J., 19, 480*
Howard, D. M., 210
Howell, L. L., 176
Huber, Florence T., 429
Huddleson, I. F., 90
Humphrey, G. C., 8, 10
Husman, A. A., 421*
Hutyra, Franz v., 63*

I

Ivey, Andrew C., 186

J

Jabbs, T. E., 355, 529
Jacob, M., 421*
Jaffray, J. B., 43*
Jewell, H. J., 183
Johanson, F. O., 246
Johnson, S. E., 216
Jones, E. C., 416*
Juranoff, A., 566

K

Kailer, W. C., 530
Kalodner, H. M., 421*
Katzke, G., 269
Keefer, W. O., 31, 101, 148, 184, 204, 297* 318, 450, 538.
Kelley, D. C., 173
Kelly, W. H., 420*
Kelsall, Samuel, 198
Kelser, R. A., 418*
Kepp, L. J., 417*
Kerr, Geo. M., 167
Kinsley, A. T., 238, 418*, 434
Knappenberger, J. A., 175
Knotts, F. R., 337*
Köbe, K., 269
Koch, W., 134
Koehler, J. P., 517
Koen, J. S., 416*, 428*
Koon, G. H., 416*
Köser, A., 82, 412, 563
Köster, O., 565
Kostner, M., 563
Köves, J., 85
Kozelka, F. L., 79
Král, F., 2*
Krammel, N., 410
Krauss, W. E., 302
Krill, W. R., 287*
Krisch, O., 410
Kron, O. J., 421*
Krukowski, S. M., 252
Krupski, A., 564
Kucera, C., 182

L

LaFond, L. H., 421*, 543*
Lacroix, J. V., 421*
Lahaye, J., 83
Lamay, E., 227
Lapolla, L., 565
Lassebre, Rev., 82
LeDune, E. K., 269, 394
Lefevre, A., 376
Lenfeld, J., 2*
Lenfesty, J. H., 294*
Lentz, W., 269
Lewitus, Victor, 32, 71, 115, 177, 221, 265, 371, 405, 446, 559
Lichtenstern, G., 273
Little, Geo. W., 396
Lockhart, Ashe, 420*
Lombard, C., 270
Longley, O. A., 419*, 553*
Lübke, A., 86
Lucas, J. W., 395*
Lührs, G., 41
Lukes, S., 270
Luy, P., 82, 272

M

McAdory, I. S., 421*
McClelland, F. E., 421*, 483*
McConnell, H. M., 422*
McConnell, W. C., 337*
McEwan, H. R., 346
McFadden, C. M., 354
McKenna, J. F., 416*, 473*, 539*
McKim, O. E., 26, 124, 362*
McKinnon, J. A., 420*
McLean, R. T., 549*
Magnusson, H., 85
Mallmann, W. L., 4
Manges, J. D., 347
Manolescu, Gh., 2*
Marke, I., 566
Markham, F. D. C., 403
Marney, U. E., 419*
Marshall, C. J., 417*
Mayo, N. S., 419*
Meads, F. F., 336*
Menendez, F., 2*
Merillat, L. A., 57, 91, 102, 144, 335, 383, 420*
Meyer, A. E., 499
Middelkoop, A. P., 412
Miessner, H., 412, 563
Millak, K., 2*
Millenbruck, E. L., 368
Miller, H. A., 358
Miller, R. F., 399
Miller, Wm. C., 196
Mills, R. H., 424
Mitchell, Wm., 43*
Mohler, J. R., 2*, 60*
Mohler, W. M., 455
Mönnig, H. O., 89
Moore, Hamlet, 417*
Morris, M. L., 421*
Mosher, L. A., 416*
Mostyn, H. J., 330
Moutaux, M., 269
Mrowka, F., 564
Munce, T. W., 419*

N

Nakamura, T., 410
Negri, F., 272
Newsom, I. E., 417*
Nichols, R. E., 289*
Nida, V., 562
Norden, C. J., 300*
Nörr, J., 271
North, A. F., Jr., 436
Novacek, A., 181
Nusshag, W., 182

O

Ooi, F., 410
Osterwalder, H., 564

P

Palmer, D. B., 418*
Palumbo, V., 134
Parker, Leo T., 76, 120, 343, 532

Patterson, F. D., 185, 186, 386*, 421*
Patton, J. W., 13, 128, 284*, 556*
Penny, S., 259
Peters, A. T., 395*
Pfeiffer, W., 272
Picot, L. L., 434
Pineteau, M., 454
Pistor, A. J., 64*
Pommer, A., 376
Pospichel, R., 411
Pribyl, E., 181
Pyle, N. J., 417*

Q

Quin, A. H., 419*

R

Radulesco, A., 376
Raffensperger, H. B., 67*
Rajoff, Edw., 249
Rautmann, H., 564, 565
Rawson, G. W., 279*
Ray, J. D., 320*, 395*
Ray, L. A., 437
Rebrassier, R. E., 320*
Reed, C. I., 229
Richter, J., 408
Ritter, R., 563
Rivera, A., 2*
Robinson, O. E., 337*
Robison, T. E., 94, 96
Roholm, K., 86
Rosner, L. A., 165
Rubay, Paul, 2*
Rummell, L. I., 316
Runge, S., 133

S

Sager, F. C., 293*
Sales, E. K., 284*
Salmon, D. W., 556
Salsbery, C. E., 45*
Sarnowiec, W., 563
Savage, A. J., 519*
Schafer, F. N., 353
Schaper, W., 375
Schlotthauer, C. F., 416*
Schmid, F., 375
Schmidt, A., 273
Schmidt, C., 137
Schmidt, J., 41
Schoening, H. W., 455
Schoenlaub, J. C., 295*
Schroeder, C. R., 508
Schroeder, E. F., 323*
Schubel, E. C. W., 279*
Seagar, M., 227, 271
Seifried, O., 268
Sharkey, S. B. V., 268
Shoemaker, J. N., 320*
Sigler, T. A., 416*
Simpson, T. V., 200
Sims, B. T., 416*
Slagsvold, L., 375
Smith, I. C., 166
Smith, S. N., 420
Spaulding, N. C., 417*
Spring, J. E., 164
Stafford, Chas. D., 438
Stanley, W. M., 377
Stay, C. M., 212
Steddom, R. P., 64*
Stein, C. D., 455
Steinbach, F. G., 393, 413
Steinmetzer, K., 411
Stephenson, R. L., 521
Sternberg, L., 415
Stevenson, J. C., 25
Stewart, S. L., 418*
Stone, R. L., 241
Stone, W. S., 239
Story, F. A., 174
Sweebe, E. E., 294*
Szepeshelyi, A., 41

T

Theobald, A. E., 185, 186, 319*, 421*, 547*
Thompson, L. E., 531
Tierney, Wm. F., 360
Townsend, N. L., 416*
Trimble, Larry, 507*
Tschebotorow, R. S., 564
Tscheredkton, W. N., 412
Udall, D. H., 186
Urbanyi, L., 566

V

Vajda, T., 410
Van der Hoeden, M., 93
Ventura, L., 273
Verge, J., 2*
Vierling, C. C., 213
Von Ostertag, Robt., 2*

W

Wähgeld, H., 492
Waldmann, D., 269
Wallace, H. C., 517
Walters, Clyde, 337*
Way, Cassius, 421*
Weingart, H., 135
Weisheit, H. C., 349
Welch, W. H., 519*
Wellmann, O., 566
Welsh, Mark, 6, 51, 522
Wempe, L. R., 404
Wester, J., 408
Wheatley, F. M., 256, 352, 353
White, A. E., Jr., 402
Wight, A. C., 297*
Wight, A. E., 417*
Williams, N. F., 233*
Williams, T., 442
Windrath, G. T., 180
Wirth, D., 36, 135, 270, 411, 484
Wiseman, E. S., 206
Wisnicky, W., 420*
Witt, R. F., 100
Wittmann, F., 492
Witzigmann, J., 84
Wooldridge, G. H., 2*
Wright, W. H., 186, 307, 312*, 390

Y

Yakimoff, W., 88
York, C. H., 320*
York, W. K., 300*

Z

Zickefoose, S. F., 202
Zinn, H., 566
Zuwerkalow, D., 566

NEVER LEAVE A MAN BEHIND

Is our social and political system going to be safe unless the leaders learn and practice the rule that is religiously observed by explorers? That rule is simple but full of meaning: Never leave a man behind. It means that the leader must bring his party through. Even the weak and sick must be brought back.

No true leader operates under the law of the survival of the fittest. He also plans for the unfit and sees to it that they, too, are brought to safety. No leader worthy of the name would do less.

Should we be content with lower standards in the fields of industry and business? The social ideal must take the place of the individualistic ideal. This does not mean that the strong individual should be curbed and prevented from using his strength. It simply means that all his strength should not be used in his own selfish behalf, but must be shared with those who are members of his party and who need his leadership and strength.

To the explorer there is nothing idealistic or impractical in that philosophy. He accepts it as a matter of course. Is it too much to hope that eventually all leaders in all fields of human endeavor will be animated by the rule which orders that it is unsporting to leave even one man behind?—*Henry Curtis.*

COLT PRODUCTION IS SHARPLY HIGHER

More than 900,000 horse and mule colts will be produced this year, the largest number in recent history, says the Bureau of Agricultural Economics in its annual outlook report.

Decreasing numbers of farm work stock stimulated increased production of colts in 1933, and there was further expansion in 1934 and 1935. An exceptionally good current demand for colts and for young mares suitable for both work and breeding is reported.

Heavy draft horses and big mules have been less in demand than lighter animals, but there has been marked improvement in demand for purebred draft animals. Reports from purebred associations show larger sales, advancing prices, greatly increased registrations, and widespread interest.

The long downward trend of horse and mule numbers is drawing to an end, says the bureau, adding that any further considerable increase in colt raising will result in a supply of work animals three to five years hence somewhat in excess of the number now on farms.

Producers of horses and mules for sale are advised to follow closely the trend of the next few years in colt production and in the use of mechanical power by farmers, in order to adjust production to future demand.

LIVER FLUKES CONTROLLED

The liver fluke is now definitely under control in Beaver County, Utah, as the result of a control campaign. This work, directed by the Zoological Division, U. S. Bureau of Animal Industry, was carried on with Federal Emergency Relief Administration funds. Beaver County had been so heavily infested with this pest that the sheep industry was nearly wiped out. Furthermore, before the control measures were begun, Federal meat inspectors found 75% of the cattle slaughtered were "flukey." The Bureau of Animal Industry points out that the methods used in Beaver County, Utah, are largely applicable to other western areas in which liver flukes have threatened success in raising sheep and cattle.

To combat liver flukes successfully it is necessary to kill several species of snail which harbor this parasite during one stage of its life. If there are none of these snails, the fluke-hatching from the egg—is unable to reach the infective stage and soon dies. Snails were practically eradicated during the campaign by destroying their breeding places and treating other infested areas with copper sulphate which, even in very dilute solution, kills snails. Since the snails prefer slow-running water and muddy bottoms, eradication work was confined mostly to the valleys.

The first step in ridding the county of the fluke was to remove rubbish and vegetation from streams, ponds, springs, and other watercourses. Before this debris and plant growth were removed, many of the streams frequently overflowed their banks thereby making ideal breeding places for the snails. When cleared these same streams flowed more rapidly and stayed in their channels. On land formerly covered with water the workers found that the snails died in less than 48 hours after the soil had dried.

In marshes and other places difficult to drain thoroughly, the broadcasting of a mixture of one pound of powdered copper sulphate to four pounds of soil killed almost 100% of the snails. Approximately 1,000 acres of marsh land were treated with this chemical at an average cost, for labor and materials, of about $4 per acre.

After the watercourses had been cleared, they were treated with copper sulphate crystals contained in heavy burlap ore bags. The chemical dissolves more gradually in such a bag than in a lighter one, such as a grain or sugar bag. The workers found that the method killed practically all snails for about 1 mile downstream. Although the solution was strong enough to kill the snails, it was too weak to injure animals drinking it.

The control program required two months and a force of 60 men most of that time. All of the workers, except the leaders, were taken from relief rolls. Most farmers cooperated, and many requested further draining of their land as a means of eliminating the liver fluke permanently. Several benefits other than improved condition of livestock were reported. The cleaning of springs and streams nearly doubled the irrigation water supply and also increased the breeding and feeding grounds for trout in the county. The work also demonstrated the feasibility of drainage projects which formerly had been considered too difficult or expensive.

CHAPIN SUCCEEDS DORSET

The appointment of Robert M. Chapin as chief of the Biochemic Division of the Bureau of Animal Industry was announced today by the U. S. Department of Agriculture.

Since the death of Dr. Marion Dorset last July, Mr. Chapin has served as acting chief of this division which is responsible for many lines of important research and other technical activities. Mr. Chapin undertakes his new duties with a background of 28 years of investigational work in the Bureau of Animal Industry. During this time he conducted research and tests for the development and standardizing of dipping fluids, disinfectants, and related products and is the author of numerous publications in those fields. He has collaborated also with other investigators in a wide range of chemical and biological studies.

Mr. Chapin is a native of Massachusetts and a graduate of Amherst College. He also took postgraduate work in chemistry in that institution and served as instructor in chemistry until 1907, when he entered the Federal B. A. I.

SUPPLY OF MARKET POULTRY

Relatively short supplies and high prices for poultry are in prospect the remainder of this year and the first half of next, says the Bureau of Agricultural Economics in its annual outlook report.

Eggs, however, will increase in supply and decline in price during this period. There will be an increased hatch of young chicks in the spring of 1936. Prices of both poultry and eggs will decline in the latter half of the year.

There are more young chickens in farm flocks now than a year ago, but poultry receipts are not likely to reflect fully this increase until late next spring, because of a tendency to save a larger than usual proportion of pullets for layers.

There are also more laying birds in farm flocks now than a year ago; there will be still more by January 1, 1936. This means an increase in egg production.

The bureau says that on the basis of volume of output, the hatchery industry in 1935 had the best year since 1930. Fairly sharp increases were reported from all sections of the country.

The higher egg prices this year are causing an expansion in commercial egg producing areas of the Pacific Coast, and larger supplies of eggs from that section can be expected at Eastern markets during 1936.

Consumer demand for eggs next year, it is stated, will depend upon consumer income and upon the price of eggs in relation to that of competitive foods. The bureau believes that consumer demand for eggs will increase.

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ARMY VETERINARY SERVICE

Major Raymond Randall is relieved from assignment and duty at the Boston quartermaster depot, Boston, Mass., and will report to the commanding general First Corps Area, Boston, Mass., for duty with the Veterinary Corps at his headquarters and for additional duty at the Boston quartermaster depot and as attending veterinarian at Harvard University.

Major Nathan M. Neate, San Francisco, Calif., will proceed to Walter Reed General Hospital, Army Medical Center, Wash., D.C., and report to the commanding officer of that hospital for observation and treatment.

By direction of the President, Colonel Burt English, upon his own application, was retired from active service October 31, 1935.

1st Lieut. Daniel S. Stevenson, now on temporary duty at Fort Hoyle, Md., is relieved from further assignment to station at Fort Bliss, Texas, and will report to the commanding general Fort Hoyle, Md., for duty.

So much of par. 30,S.O. 219,W.D., 1935, as relieves Captain Ralph M. Mohri from his present assignment and duty at Fort Riley, Kans., and directs him to proceed to New York, N. Y., and sail on or about December 31, 1935, for the Philippine Department, is revoked.

1st Lieut. Ray S. Hunsberger is relieved from his present assignment and duty at the Presidio

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SECRETOSAN for distemper
a chemical preparation for subcutaneous injection of dogs, cats and foxes.

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of Monterey, Calif., effective in time to proceed to San Francisco, Calif., and sail on the transport scheduled to leave that port on or about January 21, 1936, for the Philippine Department, for duty.

The appointment of the following-named second lieutenants, Veterinary Corps Reserve, as first lieutenants in the Veterinary Corps, Regular Army, with rank from September 30, 1935, is announced. Each officer named is assigned to the station specified opposite his name and will proceed from the place or station indicated to the station to which assigned and report to the commanding officer for duty accordingly:

Velmer Wayne McGinnis, Fort Des Moines, Ia.—Ft. Des Moines, Iowa.

John Howard Rust, III, Ft. Williams, Me.—Fort Ethan Allen, Vt.

Bernard Francis Trum, Ft. Adams, R. I.—U. S. Military Academy, West Point, N. Y.

Lloyd Christopher Tekse, Glencoe, Minn.—Ft. Snelling, Minn.

Duane LeRoy Cady, Arlington, Nebr.—Ft. Riley, Kans.

Edwin Louis Millenbruck, Ft. Moultrie, S. C.—Ft. Bragg, N. C.

Thomas Carlyle Jones, Ft. Geo. Wright, Wash.—Ft. Geo. Wright, Wash.

Major Samuel G. Kielsmeier is relieved from duty at the Robinson quartermaster depot, Fort Robinson, Nebr., effective on or about January

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Horse Back To Work in Three To Five Days

It is a powerful antidote to inflammation occurring in the periosteum, articulations, bursæ, tendons, ligaments; also where there is pain, exostosis or lameness. Usually only one application is necessary. One bottle is sufficient to treat three or more cases.

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1, 1936, will then proceed to Fort Ethan Allen, Vt., and report for duty.

Captain Maurice W. Hale is relieved from assignment and duty at the Army Veterinary School, Army Medical Center, Washington, D.C., effective on or about January 1, 1936, will then proceed to Fort Sam Houston, Texas, and report for duty.

Major John H. Kintner is relieved from further assignment and duty at Fort Sam Houston, Texas, effective on or about January 10, 1936, is then assigned to the San Francisco port of embarkation, Fort Mason, Calif., and will proceed to Washington, D. C., and report to the commanding general Army Medical Center for temporary duty until such time as will enable him to comply with this order; will then proceed to New York, N. Y., and sail on the transport scheduled to leave that port on or about March 13, 1936, for San Francisco, Calif.; upon arrival in San Francisco will report to the commanding general San Francisco port of embarkation for duty.

The resignation by 1st Lieut. Duane LeRoy Cady of his commission as an officer of the Army is accepted by the President.

1st Lieut. Thomas C. Jones is relieved from duty at Ft. Geo. Wright, Wash., effective on or about November 1, 1935, will then proceed to the Presidio of Monterey, Calif., and report for duty.

So much of par. 31,S.O. 219,W.D., 1935, as assigns Capt. Arvo T. Thompson to duty at Ft. Riley, Kans., is amended so as to assign him to duty at the Army Medical Center, Washington, D. C., upon completion of his present tour of foreign service.

Veterinary Reserve Corps

Promotions:

Milman, Maurice Howard, To: Capt., 240 W. 72nd St., New York, N. Y.

Granholm, Paul Robert, 1st Lt., Care of Jones Dairy Farm, Inc., Fort Atkinson, Wisc.

New acceptances (First lieutenants):

Johnston, Clarence Barney, 326 P. O. Bldg., Baton Rouge, La.

Krill, Walter Roland, Vet. Clinic, Ohio State Univ., Columbus, O.

Maher, Martin Patrick, Cromwell, Minn.

Scott, John Russell, 309 5th Ave., So., South St. Paul, Minn.

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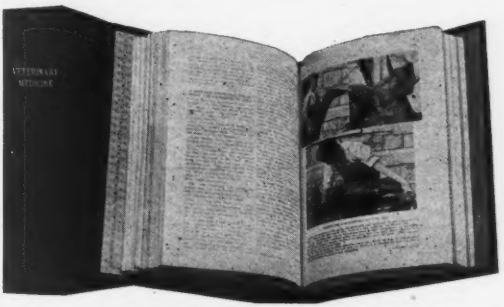

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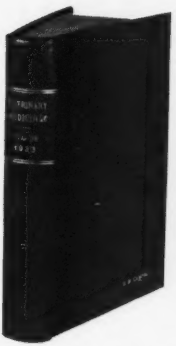

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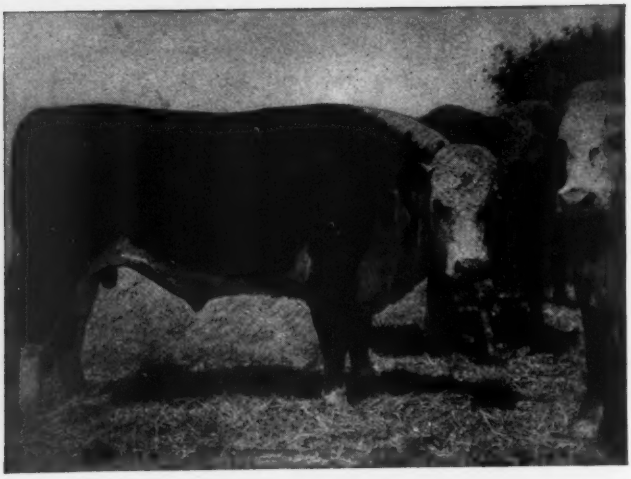

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Packages: 5 cc. vials (20 large or 40 small animals); 10 cc. vials (40 large or 80 small animals).

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Dose: From 30 to 100 cc. Continue at 6-hour intervals until there is a drop in temperature.

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Packages: 25, 50, 100 and 250 cc.

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Dose: 30 to 100 cc. intravenously or subcutaneously.

Package: 100 cc. vial.

HEMORRHAGIC SEPTICEMIA AGGRESSIN

Dose: 5 cc. for horses and cattle, 2½ cc. for sheep, goats and swine, ½ cc. for fowl.

Packages: 25, 50, 100 and 250 cc. vials.

HEMORRHAGIC SEPTICEMIA VACCINE (Whole Culture)

A chemically killed undiluted whole culture.

Dosage: 5 cc. for cattle and horses; 3 to 5 cc. for swine and sheep; 1 cc. for fowl.

Packages: 50 and 250 cc. vials.

ANTI-HEMORRHAGIC SEPTICEMIA SERUM

For prophylaxis: Cattle and horses, dose 15 cc.; swine, sheep and goats, dose 10 cc.; fowl, dose 2½ cc.

For treatment: 50 to 100 cc. Repeat in 12 to 24 hours.

Packages: 100 and 500 cc. vials.

MASTITIS MIXED VACCINE
(Bovine) (Whole Culture)

For infectious Mastitis and Garget in cattle.

Dose: 5 cc. per animal.

Packages: 50 and 250 cc. vials.

MIXED BACTERIAL VACCINE
(Bovine) (Whole Culture)

For Infectious Metritis and retained placenta.

Treatment: 5 cc. per animal and repeat in 3 days.

Prophylaxis: 5 cc. for each animal on the premises. Repeat in 7 to 14 days.

Package: 50 cc. vial.

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(Whole Culture)

Dose: 5 cc. per animal.

Package: 50 cc. vial.

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For White Scours in calves and navel-ill in foals.

Dose: Prevention, 10 cc.; treatment, 30 cc. or more as required. Repeat as frequently as needed.

Packages: 10, 30 and 100 cc. vials.

• HORSES •

EQUINE INFLUENZA VACCINE
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A single 5 cc. dose gives a mild protection. Three doses give a more lasting protection.

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For *prophylaxis* use 50 cc.; for *treatment* use 50 to 100 cc., and repeat in 12 to 24 hours if necessary.

Package: 50 cc. vial.

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For the diagnosis of Glanders in horses.

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For mixed infections in horses.

Dose: 5 cc. per animal.

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For *immunization*, 1500 units. For *treatment*, from 10,000 to 100,000 units.

Packages: 1500 and 5000 units in syringes or vials; 10,000 and 20,000 units in vials.

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For lasting protection against tetanus.

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Active virus to be used with serum in immunising hogs.

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For immunising dogs against Distemper. (One or two doses of 5 cc.).

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Laidlaw-Dunkin Method

For completing the immunization against Canine Distemper. Use only after vaccine (from 14 to 21 days).

Package: 1 dose (10 mg. virus in syringe with diluent).

ANTI-CANINE DISTEMPER SERUM

Prepared by hyperimmunising dogs with Canine Distemper Virus (Laidlaw-Dunkin), and organisms associated with the complications of distemper.

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For treatment: 2 cc. per pound of body weight. Repeat in from 6–12 hours till symptoms are controlled.

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For the various mixed infections in dogs and the secondary infections following distemper.

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Immunises for approximately one year. Repeat annually.

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For the prevention and treatment of distemper and infectious enteritis complications in cats.

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For the treatment of mixed infections in dogs and the complications of distemper.

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Misrepresentation, either oral or written, is contrary to Kansas law. The seller was pronounced guilty and fined on account of the verbal statements. It is the first conviction on such charges secured through the activities of the Control Division under that particular clause of the Livestock Remedy law.

Kansas farmers have suffered much loss from the invasion of agents selling alleged livestock and poultry remedies. Some were very dishonest in their dealings and brought disrepute on the whole travelling fraternity representing livestock remedies. Due to the rigid inspection under the livestock remedy law such cases of infraction are now rare, and violators do not last very long in the field. It seems, however, Kansas is denying to these agents their constitutional right of free speech. How can a livestock remedy salesman say anything if he is denied the privilege of lying?

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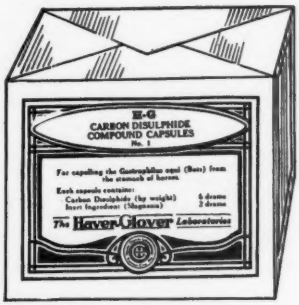

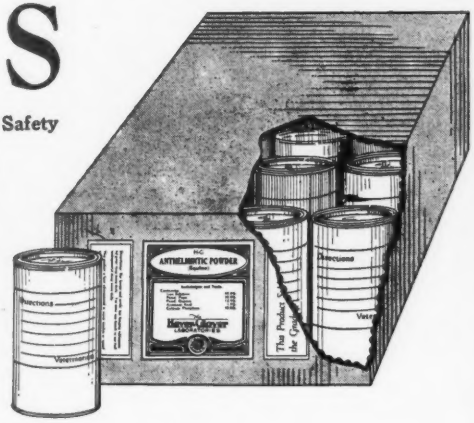

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Improved Dry Mass Capsules or the tough, Liquid Capsules given with the Mackelly Balling Gun and followed up with Anthelmintic Powder (Equine) to expel the blood-sucking worms not removable with carbon disulphide insure maximum extermination.

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TINS OF 100	10.50	7.50

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TINS OF 25	$ 2.75	
TINS OF 20		$1.70
TINS OF 100	10.50	7.50

ANTHELMINTIC POWDER (Equine) per doz., 16 oz. cans, **$3.50**; 5 lb. can, **$1.50**

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Herbert S. Wooters, Champaign, Illinois, died October 16, 1935 in the Barnes Hospital, St. Louis, after an illness of several months. Doctor Wooters was graduated from the Chicago Veterinary College in 1913, and entered general practice immediately. He was a second lieutenant in the Veterinary Corps during the World War. Later, he practiced at Moweaqua, then at Peoria, and several years ago settled in Champaign, where he specialized in small animal practice and had a hospital that was regrded as one of the best in central Illinois. He is survived by his widow, his mother, one brother and two sisters.

SCREW WORMS REACH CORN BELT

The screw worm, one of the most destructive pests of livestock, attacked animals this year in several Northern States. Strong fliers though they are, these insects could never have traveled under their own power so far from the South, where they cause heavy losses among all classes of livestock. Apparently the pest, in its maggot stage, was carried on infested cattle and sheep shipped north in response to the stimulation of rising meat prices and abundant feed in the Corn Belt. In this new territory it spread in fourteen counties in central western Illinois, in eastern Missouri, and in southwestern Iowa. There have been more than 7,000 screw worm cases in Illinois and the pest killed about 400 animals there.

If you have never received a sample—

$1.00 Bottle FREE

Harlton's Liquid Blister

Indicated in all cases in which a powerful, penetrating blister is required.

Easy to apply. You will find it has advantages over all other counter-irritants.

Free Booklet — "Reminders in Diagnosing Obscure Lameness."

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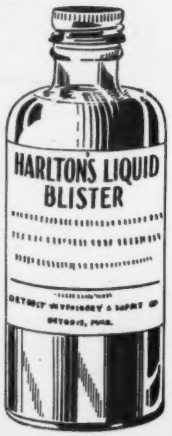

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Cattle brought into the United States from countries other than Mexico must be tested and found negative for Bang's disease unless they are for immediate slaughter, according to a new regulation, Amendment 1 to B. A. I. Order 352, just issued by the U. S. Department of Agriculture. The order becomes effective January 1, 1936. It applies to all cattle, six months old or more, imported for breeding or milking purposes.

In the first 13 months of the campaign against Bang's disease, more than three and one-half million cattle were tested, of which 11.2 per cent reacted and were removed from the herds for slaughter.

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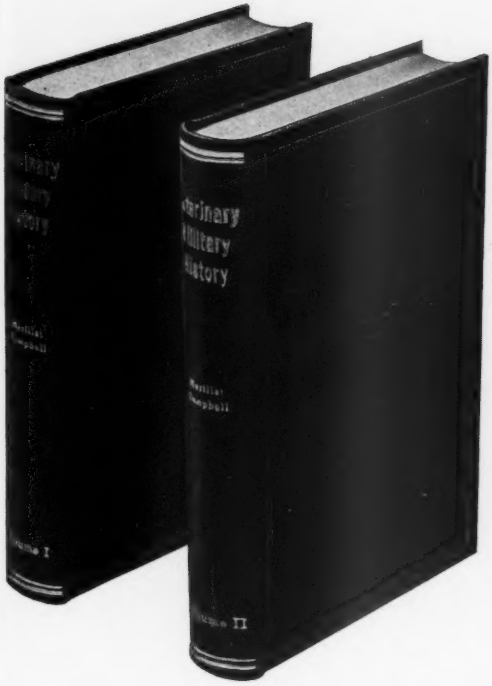
By Drs. L. A. Merillat and D. M. Campbell



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